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TAMPERE UNIVERSITY OF TECHNOLOGY

JOHAN SAARELA

EVALUATING SOCIABILITY IN FITNESS-RELATED WEB SERVICES

Master of Science Thesis

Examiners: Sari Kujala, Sanna Malinen
Examiner and topic approved in the Faculty of Computing and Electrical Engineering Council meeting on 3 February 2010

ABSTRACT

TAMPERE UNIVERSITY OF TECHNOLOGY
Master's Degree Programme in Information Technology
SAARELA, JOHAN: Evaluating sociability in fitness-related web services
Master of Science Thesis, 72 pages, 22 appendix pages
May 2010
Major: Usability
Examiners: Sari Kujala, Sanna Malinen
Keywords: online communities, sociability, heuristics, fitness

Fitness and sociability online are two very interesting subjects for research at the moment. In this thesis the aim is to study a combination of these subjects, fitness-related web services with social features. The main motivation for this research is the validation of sociability heuristics devised in the PROFCOM project. In addition, the study aims to find out about users' opinions regarding social aspects of fitness-related web services. The focus in the study is on sociability and what kind of social features users want included in such a web service, if any. The study also aims to describe how such features affect user experience.

The study was carried out using three fitness-related web services. These were Suunto Movescount, Nokia Sports Tracker and Polar Personal Trainer. Suunto Movescount was still being developed at the time of the study. The two other services had been in public use for several years. At the beginning of the study, heuristic evaluations were conducted to all three services in order to gather information about their social features and sociability. The evaluations were carried out using the eight PROFCOM sociability heuristics, Nielsen's five participation guidelines and a collection of nine sociability heuristics devised by Preece.

In order to validate sociability heuristics and gather information regarding sociability in fitness-related web services, users from all three services were interviewed. A total of 20 interviews were carried out. In addition, the 10 interviewees who used Suunto Movescount took part in a diary study designed to gather information during the testing of the service. The results of the interviews and diary study were summarized and used to analyze the users' opinions in regard to sociability. These results were also compared to the results of the heuristic evaluations in order to validate the sociability heuristics.

Based on the findings in this study, the sociability heuristics produce analogous results to those gathered from users when evaluating sociability. The most serious problems can be found by both methods although there are differences in the results in regard to less critical sociability issues. Some problems noted during heuristic evaluation are not necessarily problems for users and vice versa. This indicates that whilst heuristics can significantly help in evaluating sociability, using them as the only tool involves a risk of erroneous conclusions.

Interviewees' opinions suggest that fitness-related web services that include social features should offer users different ways of interacting. It is also important to consider what users actually use the service for. If the main purpose is maintaining a training diary, social features should be designed to support this. On the other hand, if the focus is on creating an online community, the biggest effort should be aimed at designing ways of interaction that feel natural to users and encourage discussion among them.

TIIVISTELMÄ

TAMPEREEN TEKNILLINEN YLIOPISTO
Tietotekniikan koulutusohjelma
SAARELA, JOHAN: Kuntoilua tukevien verkkopalvelujen yhteisöllisyyden arviointi, 72 sivua, 22 liitesivua
Toukokuu 2010
Pääaine: Käytettävyys
Tarkastajat: Sari Kujala, Sanna Malinen
Avainsanat: verkkoyhteisöt, yhteisöllisyys, heuristiikat, kuntoilu

Yhteisöllisyys Internetissä sekä kuntoilu ovat tällä hetkellä kaksi hyvin mielenkiintoista tutkimusaihetta. Tämän työn tavoitteena on tutkia näiden aiheiden yhdistelmää, kuntoilua tukevia yhteisöllisiä verkkopalveluja. Keskeisin peruste tutkimukselle on PROFCOM–projektissa kehitettyjen yhteisöllisyysheuristiikkojen validointi. Tutkimuksen tavoitteena on myös saada käsitys käyttäjien toiveista sosiaalisuuden suhteen kuntoilua tukevissa verkkopalveluissa. Tutkimuksen pääpaino on yhteisöllisyydessä sekä siinä, millaisia sosiaalisia toimintoja käyttäjät mahdollisesti kaipaavat tämän tyyppiseen verkkopalveluun. Tutkimuksessa pyritään myös kuvaamaan miten tällaiset toiminnot vaikuttavat käyttökokemukseen.

Tutkimuksessa tutkittiin kolmea kuntoilua tukevaa verkkopalvelua, jotka olivat Suunto Movescount, Nokia Sports Tracker ja Polar Personal Trainer. Suunto Movescount oli vielä kehitysvaiheessa tutkimuksen aikana. Kaksi muuta palvelua olivat olleet julkisessa käytössä useita vuosia. Tutkimuksen alussa kaikille palveluille suoritettiin heuristinen arviointi, jolla kerättiin tietoa niiden sosiaalisista ominaisuuksista ja yhteisöllisyydestä. Arvioinnissa käytettiin kahdeksaa PROFCOM-yhteisöllisyysheuristiikkaa, Nielsenin viittä suositusta osallistumisen tukemiseen sekä Preecen yhdeksän yhteisöllisyysheuristiikan kokoelmaa.

Yhteisöllisyysheuristiikkojen validoimiseksi ja yhteisöllisyyteen liittyvän tiedon keräämiseksi kaikkien kolmen palvelun käyttäjiä haastateltiin. Haastatteluja tehtiin yhteensä 20. Tämän lisäksi kaikki 10 haastateltavaa Suunto Movescount-palvelun käyttäjää osallistuivat päiväkirjatutkimukseen, jolla kerättiin tietoa koko testijakson ajalta. Haastattelujen ja päiväkirjojen vastausten avulla tutkittiin käyttäjien yhteisöllisyyteen liittyviä mielipiteitä. Näitä vastauksia verrattiin myös heuristisen arvioinnin tuloksiin heuristiikkojen validoimiseksi.

Tutkimuksen perusteella yhteisöllisyysheuristiikat tuottavat samansuuntaisia tuloksia yhteisöllisyyden arvioinnissa kuin käyttäjähaastattelut. Vakavimmat ongelmat löydetään kummallakin menetelmällä vaikka pienempien yhteisöllisyysongelmien tapauksessa eroja löytyy. Jotkin heuristisessa arvioinnissa löydetyt ongelmat eivät välttämättä olekaan sellaisia käyttäjille ja päinvastoin. Tämän perusteella heuristiikkojen käyttäminen ainoana työkaluna sisältää riskin virheellisistä johtopäätöksistä, vaikka ne voivatkin auttaa merkittävästi yhteisöllisyyden arvioinnissa.

Käyttäjien mielipiteiden perusteella sosiaalisia toimintoja sisältävän liikuntaa tukevan verkkopalvelun tulisi tarjota erilaisia tapoja kommunikoida. On myös tärkeää pohtia mihin käyttäjät palvelua käyttävät. Jos keskeisin käyttötarkoitus on harjoituspäiväkirja, sosiaalisten toimintojen tulisi tukea tätä. Toisaalta jos tarkoituksena on luoda yhteisö, palvelussa tulisi panostaa käyttäjille luonnollisten vuorovaikutustapojen kehittämiseen sekä käyttäjienvälisen keskustelun kannustamiseen.

PREFACE

The research was carried out and this thesis written during autumn and winter 2009-2010. The study was done in corporation with the Unit of Human-Centered Technology at Tampere University of Technology, alongside and as a part of the PROFCOM project that also involves the Technology Business Research Center at Lappeenranta University of Technology. The research was conducted by a group comprising three members. My contribution to the project was taking part in gathering, analyzing and comparing data from heuristic evaluations and interviews with users of three fitness-related web services.

The subject of the study was devised based on on-going research projects at the Unit of Human-Centered Technology at Tampere University of Technology and my personal interest in fitness-related web services and online communities. Since I had little experience in online communities, this thesis offered me an ideal chance to learn more about them and their users.

The biggest challenge whilst working on this study was definitely the writing process. Nevertheless, the interesting subject and strict timetable helped in staying constantly motivated. Pretty much all aspects of the study from planning interviews to comparing the final results were pleasant, the only slightly problematic activity being finding and recruiting interviewees.

I would like to thank professor Sari Kujala who helped in devising the subject for my thesis and provided me with help and suggestions throughout the whole process. I would also like to thank the other members of the research team, researcher Sanna Malinen and research assistant Jarno Ojala, who helped me with planning and carrying out my part of the study, and also provided me with source material essential for my thesis. Further, I wish to thank Suunto for supplying me with gifts for interviewees taking part in my personal part of the study.

On a more personal note, I would most of all like to thank my mom and dad for providing support throughout my studies (and life). I would also like to thank Laura and Sami, who have helped me in the course of my studies, and who despite my excessive secretiveness refrained from using thumbscrews to get to the truth about my thesis.

Tampere, 29th March 2010

Johan Saarela

INDEX

TERMINOLOGY

Extrinsic rewards	Incentives, such as wages, help, or disclosure of information, which can be offered to a person in order to affect his or her behaviour (Bénabou & Tirole, 2003).
Intrinsic motivation	The individual's desire to perform a task for its own sake (Bénabou & Tirole, 2003).
Latent ties	Interpersonal connections that are technically possible but not yet activated socially (Haythornthwaite, 2005).
Lurker	A user who rarely or never posts messages in a web service (Nonnecke & Preece, 2000).
Online community	A gathering of people who interact with each other using a virtual environment and are guided by norms and policies (Preece, 2000).
Online social network	See "Online community".
Sociability	The social interactions of the members of a community and the policies that guide them (Preece et al., 2003).
Social network site	See "Online community".
Strong ties	People's relationships to friends with whom they are in contact continuously (Granovetter, 1973).
Virtual community	See "Online community".
Weak ties	People's relationships to acquaintances with whom they are in contact infrequently (Granovetter, 1973).
Wiki	A collaborative web-based system that users have complete control over (Krahn et al., 2009).

1. INTRODUCTION

The various health benefits of exercise have been widely reported in scientific research (Fletcher et al., 1996). In addition to physical benefits, exercise is also linked to improving psychological functioning (Fletcher et al., 1996). Therefore, there is a clear need to help motivate people to exercise. One way of creating motivation is to build social connections between people who then offer encouragement and support to each other. This can potentially be achieved using, for example, an online community.

As more people start using heart rate monitors and GPS devices to track their training, there is also a need for tools that help understand and utilize the gathered data. One such tool can be a web service that users can store their data on. Such a service also opens new possibilities related to social interaction that not only help in developing one's own fitness but also enable people to form new connections and friendships.

The concept of sociability aims to describe how interaction between users works in an online community, and the policies that guide this interaction (Preece et al., 2003). Sociability therefore includes not only direct discussion using, for example, a forum, but also indirect communication and the overall feel of being a part of a community. In a web service, this features various subjects from the user being able to express oneself in a preferred manner to supporting the formation of large user networks.

Users of online communities can have different demands in regard to sociability. Therefore, it can be difficult to define specific factors that result in a successful online community. Success is also dependant on the viewpoint and by what standards it is measured. However, in addition to strictly financial factors, there are also some hallmarks that indicate that an online community is a success. For example, more important than the number of users may be the atmosphere and quality of discussions (Preece, 2001). Another important aspect of a successful online community is a general trustworthiness between users (Preece, 2001). These types of indicators can be very difficult to assess from an outside viewpoint. This is perhaps one of the main reasons why the majority of online community research has been carried out by studying and interviewing community members (Iriberri & Leroy, 2009).

One measure that can potentially be used to evaluate success in an online community is studying determinants of sociability (Preece, 2001). This thesis aims to answer several questions related to evaluating sociability in fitness-related web services. Firstly, comparisons are made between results gathered using heuristic evaluation and interviews from the same services in order to determine whether heuristics can be used to accurately evaluate sociability. The validation of these heuristics would mean that, for example, developers could use these heuristics with other methods to ensure that the

online community addresses all aspects of sociability. Using heuristics to evaluate sociability could be beneficial especially in the early stages of development when other methods are difficult to utilize due to financial reasons or the lack of a working model.

In addition, the research aims to gather information from the users about their use of the fitness-related web services in question. This includes the question whether users want to be a part of a community or simply use a service to keep track of their own exercises. If users are interested merely in their own training and do not want to interact with other people in the service, creating elaborate social features may be fruitless. Subsequently, a main question in the research is how sociability and social features affect the overall user experience. This is an important question since such features alter the service's character from a normal web service into an online community. If sociability does not improve the user experience, the service may function better as a traditional web service than an online community.

Another important question in this research is what kinds of social features people prefer to use on a fitness-related service. Users may want to talk to friends or previously unknown users in private or publicly about matters related to fitness, share workouts with them or organize group activities in the service. Depending on the needs, the service should include the appropriate features so that users can express themselves and connect with others the way they want.

In order to gather information related to the research questions listed above, three potential fitness-related online community services were studied. These services were Suunto Movescount, Nokia Sports Tracker and Polar Personal Trainer. During the research, Suunto Movescount was still in development and not available to the public. Nokia Sports Tracker and Polar Personal Trainer, on the other hand, had both been in public use for several years.

In the study, qualitative methods were used to gather information about the use of the fitness-related web services in question. In addition, quantitative information was gathered using questionnaires. These questionnaires were filled in by interviewees during interviews that were carried out in order to gain a picture of how people use the services and what kind of role sociability plays in the use. The same aspects were also studied using heuristic evaluation in order to examine whether the evaluation produced similar results as the interviews. In order to gain further information about the testing period of Suunto Movescount, all its test users were also asked to fill in a diary after each use of the service.

This thesis is divided into a total of five chapters including this introduction. Chapter 2 features the theoretical background behind the research carried out during the study. Chapter 3 describes the different methods used in the study and how they were utilized. The results of the study are discussed in Chapter 4 along with comparison of results gathered using different methods for the purpose of validating sociability heuristics. Finally, Chapter 5 includes the conclusions reached during the study. The chapter also features discussion about generalisation of the conclusions and possible future research.

2. THEORETICAL BACKGROUND

This chapter describes the theory and previous research that is related to the study carried out for this thesis. The chapter covers what online communities are and how they have developed into their current form. In addition, reasons for joining online communities are discussed along with problems online communities face. This chapter also covers methods for motivating member participation.

These issues are discussed in order to gain an understanding of what online communities are and for what kinds of purposes they can be used. In addition, this chapter aims to explain how online community success can be evaluated. This information is important not only for research purposes but also for the designers and administrators of online communities. Understanding which factors make an online community successful will help to focus the study on aspects of the community that are most relevant.

Since all three online communities featured in this study have been created by corporations, this chapter also includes discussion about the business aspects of online communities and how they can be utilized commercially. In addition, this chapter includes information about evaluating user experience.

2.1. Online communities

Boyd and Ellison (2007) offer a three-part definition for what online communities are. According to their description, online communities are web-based services that allow people to create a public or semi-public profile within a bounded system, articulate a list of users they share connections with, and view and traverse lists of connections made by members of the service.

As Mislove et al. (2007) state, online communities are organized around users in contrast to other web sites that are organized around content. What this means is that sharing information and content in online communities can be seen as a part of communication. Another, opposite way of viewing online communities would be that interpersonal communication existed simply so that users were able to receive new information from other users. In this case, sharing and finding information would be the main objective and there would not be a true need for communality or direct contact between users.

2.1.1. History of online communities

Ever since 1972 when ARPAnet developed the first version of the email, communication has been an increasingly popular use for the Internet (Preece et al., 2003). In the mean time, communication methods started to develop from simple point to point email messages into more complex systems such as electronic bulletin boards and chat systems such as IRC. As Ridings and Gefen (2004) state, the first Internet services widely regarded as online communities were Usenet newsgroups that were devised in 1979.

The developing communication systems enabled users to communicate with a larger number of people and in real time. In addition, the release of the World-Wide Web in 1991 (Preece et al., 2003) meant that like-minded people were able to create web sites that could be used as a tool for attracting new members to the community.

In recent years there has been a rapid increase of online communities that comprise more than just discussion among members. Modern communities can include applications created by administrators or other users for the purpose of deepening communication through joint ventures related to the theme of the community. For example, in the case of a fitness-related community, a venture can be to together run the distance equivalent to a trip around the world. To increase the sense of community even more, community members may organize events in which they can meet and strive together toward their common goal.

Boyd and Ellison (2007) state that according to their definition, described at the beginning of Chapter 2.1, the first recognizable social network site was SixDegrees.com, launched in 1997. They note that this was the first site that combined user profiles and the ability to list friends and browse these friend lists. Although more and more people were starting to use the Internet, the users of SixDegrees.com did not create extended networks of friends (Boyd & Ellison, 2007). According to Boyd and Ellison (2007), most of the users were not even interested in meeting new people online at the time.

Following SixDegrees.com, many similar community tools were created during the period from 1997 to 2001 (Boyd & Ellison, 2007). Boyd and Ellison (2007) state that the next significant change in social networking sites was when in 2001, Ryze.com, a site for leveraging people's business networks, was launched. Although the site itself never reached a high level of popularity, it inspired many new networking sites that despite their varying success in turn have led to currently popular social networking sites such as MySpace and Facebook (Boyd & Ellison, 2007).

2.1.2. Determining success

In her article, Preece (2001) notes that different types of online communities should be measured by different standards. According to her, some online communities may have clear quantifiable goals which form a base for measuring success whilst others are based on more soft values such as social support. Another important point raised by Preece

(2001) is that success is subjective. Online communities related to businesses or their products naturally have a tendency to look at profits to measure their success. If profits seem unaffected, the company may deem the online community a failure even though it has gathered a large user base and features active discussion. In such a case, it would seem that the online community itself is successful but the company behind it has failed to capitalize on the success.

As Preece (2001) states, ethnography has been widely used to study online communities and to help understand human behaviour within them. Nevertheless, she also sees a need for an alternative approach to describing online community success. According to Preece (2001), online community success can be evaluated with the help of usability and sociability. She states that the most important usability factors in evaluating online community success are dialog and social interaction support, information design, navigation and access. Dialog and social interaction means that the site's prompts and feedback support interaction and commands can be executed easily whilst information design refers to how understandable and aesthetically pleasing the community's information is (Preece, 2001). The two final factors, navigation and access, are related to how easily users can move around and find what they want and how clearly the technical requirements for using the community's software are stated (Preece, 2001). Nevertheless, Preece (2001) also adds that all other usability aspects of web-based software can also be applied in the evaluation of online communities.

There are many different aspects of online communities that can be considered marks for success. As Preece (2001) notes, for example, the number of members is a simple indicator of how popular an online community is. Furthermore, some online communities strive to create new types of features that enhance interpersonal communication that potentially attract more members. However, these kinds of metrics do not necessarily give researchers the true scale of the community's success.

Cothrel (2000) also lists some examples of quantitative data that can be considered when measuring the success of an online community. These include, for example, the number of unique and repeat visitors, how long visitors use the site and the frequency at which users add new content. However, Cothrel (2000) also admits that in the case of commercial online communities, these measures only describe the general health of the community. He therefore states that other types of measures are needed to evaluate actual commercial success; prominently measures that help determine the actual return on investment. Cothrel (2000) also points out that community measures should not be used just for keeping score, but also to make actual development decisions to improve the community.

Although numeric variables have the benefit of simplicity, they do not necessarily give a good indication of what the online community's atmosphere is like. Nevertheless, for the members, the overall atmosphere and quality of discussion are probably more important than the size of the online community or the service's unique features.

2.1.3. Evaluating sociability

Preece's (2001) framework for evaluating sociability consists of three main themes: purpose, people and policies. In her article, she lists various determinants related to these three themes. Purpose includes various numeric variables but also issues that are more ambiguous, such as how interactivity in the online community can be measured (Preece, 2001). Another issue discussed by Preece (2001) is reciprocity, meaning the ratio between what users give to the community and what they gain from being a part of it.

The second theme in Preece's (2001) framework, people, also includes numeric variables that help analyze the online community. These variables include, for example, the number of participants and the average share of lurkers in the community.

Policies, the final theme in Preece's (2001) framework, include determinants that are arguably more difficult to assess. In addition to uncivil behaviour, she raises the issue of trustworthiness in an online community. She notes that, depending on the type of community, the role of trust can be a complex subject. In the case of a community that revolves around emotional support, trustworthiness of users is clearly a central issue (Preece, 2001). However, Preece (2001) further notes that a rating system for measuring trustworthiness would be too simplistic and potentially even dangerous.

2.2. Why people join online communities

Ridings and Gefen (2004) conducted a study by posting the open-ended question "Why did you join this virtual community?" on various online community sites. They received a total of 399 responses from users of 27 different communities. They used these responses to find the main reasons for joining online communities. Based on the research, Ridings and Gefen (2004) classify the reasons for people to use online communities into six categories: gathering information, social support, friendship, recreation, common interest and technical reasons. These aspects are described in more detail in the following subchapters.

In another study conducted by Leitner et al. (2008), 21 participants were interviewed to find behaviour motives behind the use of online communities. Leitner et al. (2008) state that the most obvious characteristics of online community use appeared to be communication purposes, creating new relationships and exchange of opinions and information. Furthermore, they state that when joining an online community, people want to gather information and communicate about interesting topics, learn from other people and maintain and strengthen relationships.

Armstrong and Hagel (2000) note that communities of transaction such as sites used for buying and selling products and services are not communities in the traditional sense but may nevertheless encourage people to interact in order to obtain more information about products on sale. Whilst for example buying products is the user's main objective, he or she may want to consult with other users in order to make a

decision about whether a product is suitable for him or her. This discussion may lead to new social contacts and the buyer becoming a part of the community. This is a good example of how people who are not looking to join a community end up doing so as a side-product of their main goal.

In addition to communities of transaction, Armstrong and Hagel (2000) list three other types of communities: communities of interest, fantasy and relationship. Although the different types of communities have different characteristics, Armstrong and Hagel (2000) also point out that these four sorts of community are not mutually exclusive. This means that in real life, people joining a community may be simultaneously looking for different aspects of community interaction.

2.2.1. Gathering information

As Wellman (1996) points out, the nature of electronic communication supports a focus on information exchanges. Access to information is therefore often one of the main reasons for joining online communities. Horrigan et al. (2001) discovered using a survey that people belonging to entertainment, professional or sports groups primarily took part in the community in order to obtain information. However, as Zhang and Ackerman (2005) point out based on their research, social characteristics and interaction within the community also affects finding information. Furthermore, Wellman (1996) notes that so called weak ties between users online aid in the search for information. Weak ties refer to people's relationships to acquaintances they communicate with infrequently (Granovetter, 1973). Wellman's (1996) notion therefore implies that lurkers or complete outsiders will not be able to find information at a community site as effectively as users who take part in the community's discussions. This view is also supported by Preece's (2004) research.

Quan-Haase (2005) states that the transition from traditional teaching to online learning is an increasingly important aspect of gathering information on the Internet. In her article, she discusses the theory and practice of online learning. Whilst she sees online learning as an important use for online communities, she also states that it is not currently threatening traditional education but instead simply offers an alternative form of learning. Quan-Haase (2005) describes online communities as a viable solution for learning in cases where traditional classroom learning is difficult due to scheduling or other reasons. Educational purposes can be seen as a distinct and separate type of use of online communities but observations gathered in communities used for learning can potentially also be utilized in communities that focus on people generally finding and sharing information.

2.2.2. Social support

According to Wellman and Gulia (1997), people are more willing to help strangers in online communities than in real life. They note that this may be due to the fact that it is much easier to withdraw from the situation if needed than in face-to-face interactions.

Therefore, the threshold for answering questions or participating in general is lowered. This can encourage people to form contacts with people they subsequently interact with occasionally. These types of contacts are referred to as weak ties (Granovetter, 1973).

Wellman and Gulia's (1997) article implies that weak ties can even be more helpful in some situations than strong ties formed with friends. They argue that "On-line and off-line, weak ties are more apt than strong ties to link people with different social characteristics." According to them, the usefulness of the information or support received from other users depends heavily on their social characteristics. In practise this means that users should not attempt to find socially-similar people, but rather a variety of people with different characteristics. Wellman and Gulia (1997) base this argument on the study conducted by Constant et al. (1996) that notes that people are better able to solve problems when receiving help from a greater variety of people. This notion is important since an online community can be a useful tool in connecting people with different social characteristics, who might not form contacts in the real world.

During the early stages of online communities, they supported only textual information which meant that relaying emotions could be difficult and misinterpretations about the writer's tone were therefore easy to make. The problem was addressed but not completely solved by Kevin Mackenzie in 1979, when he invented the first emoticon that could be used to liven up textual communication (Preece et al., 2003). The widespread use of emoticons nowadays is just one indication of how important it is for users to connect with others on a deeper level than just exchange information.

2.2.3. Friendship

In addition to the possibility of forming new weak ties with other users, online communities also provide a place for continuing friendships and seeking new ones (Ridings & Gefen, 2004). As Igbaria (1999) points out, online communities give people the possibility to stay in contact regardless of geographic locations or time zones. Wellman (1997) also states that online communities can be helpful for isolated people who for different reasons are unable to form friendships through face-to-face contact.

According to Ridings and Gefen (2004), friendship in social communities is about the value of being together whereas social support deals with seeking or giving emotional help. Whilst friends in online communities may provide the person with information and social support, Ridings and Gefen (2004) point out that people seeking information or social support do not necessarily want to form new friendships with other users. On the other hand, as Parks (1996) points out in his research report, people can also use the Internet for general discussion and forming new friendships without any specific information needs. It can be argued that this also applies to online communities (Rheingold, 1993).

Ellison et al. (2007) suggest that people use the popular online community site Facebook to maintain existing offline relationships instead of meeting new people. In their research, they note that users had edited their profiles in order to enable existing

offline contacts to find them more easily (Ellison et. al 2007). Furthermore, the same research team note in another study that users search for people they have previous offline connections with more than they look for new connections with strangers (Lampe et al., 2006). In addition, according to a study conducted by Pew Internet & American Life Project, 91 percent of teens using online communities in the U.S. use them to communicate with friends they see often offline (Lenhart & Madden, 2007). However, Ellison et al. (2007) suggest that Facebook might make it easier converting latent ties into weak ones. They state that this is supported by the users' public personal information and the possibility of seeing their social connections.

Contrary to the view expressed by Ellison et al. (2007), Virtanen and Malinen (2008) note that many users of Facebook do use it to meet new people. Although they agree that Facebook is used more to support real-life relationships, Virtanen and Malinen (2008) also state that in their study comprising a total of 240 Finnish Facebook users, 34 percent of them reported having met new people through Facebook. Although this is a minority, the study clearly indicates that for some users finding new people is an important aspect of using Facebook.

2.2.4. Recreation

Ridings and Gefen (2004) point out that in addition to seeking information or personal contacts, people use online communities for recreation. Likewise, Jackson (1999) states that the recreational use of the Internet can be compared to watching television. For example, Reid (1999) discusses so called MUDs, multi-user virtual reality systems, and states that many of them have a clear focus on recreation over more information-based communication. She also covers Usenet newsgroups and points out that although the more matter-of-fact newsgroups may be important professional resources, they can also be used partially or purely for recreation.

As Seay et al. (2004) note, for a few decades, gaming was mostly carried out in solitude. They also describe how in the 1990s, multiplayer games started to become increasingly popular and eventually technology has enabled the creation of games that support thousands of players on one server. As a result, people playing collaboratively online have formed relationships within gaming communities (Seay et al., 2004). Furthermore, Nardi and Harris (2006) see all online gaming as collaborative, even when players are competing against each other. They are nevertheless together pursuing a common goal, having fun (Nardi & Harris, 2006).

2.2.5. Other reasons

In addition to the reasons listed above, Ridings and Gefen (2004) bring forth two additional reasons for using online communities: technical reasons and common interest. Technical reasons may seem less important, but according to Ridings and Gefen (2004), several respondents in their research mentioned that technical aspects had motivated them to join an online community. These included, for example, an

exceptional interface or search function that had lured the user to the community. Although technical reasons were the least significant, their effect was nevertheless prominent in certain cases according to Ridings and Gefen (2004).

Common interest could be seen as a part of recreational reasons since Ridings and Gefen (2004) describe it as "love of the topic of the community". This indicates that the users merely want to take part in the discussion about a certain topic without necessarily looking for new information or social connections. In such cases, social features and the overall sociability are clearly in a prominent role.

Users can also join an online community in order to gain reputation or admiration from others. Whilst these reasons seem merely selfish, they can also have a positive effect on interaction within the community. As Xiong and Liu (2003) explain in their article, reputation information can be used to minimize threats especially in communities based around business transactions. However, they also claim that reputation can not be based solely on feedback from other users since it is inaccurate. Instead, they propose a reputation system that is based both on user feedback and information about the user's transaction history. Xiong and Liu (2003) state that, according to their research, such a system is effective in creating more transactions between users. This indicates that individual users' reputations can be utilized in making the community more vibrant. From the user's viewpoint, building reputation can also be a method for gaining more personal benefits from taking part in the community, such as new possibilities for transactions.

2.3. Problematic issues in online communities

As Beenen et al. (2004) note, the lack of participation is a problem for many online communities. The community's members and site designers should therefore concentrate on creating a community where participation is encouraged.

In their research, Brandtzæg and Heim (2008) studied reasons that had led to people to stop using an online community site or decreasing use. They found various reasons, some of which are covered in the following subchapters. In addition to usability related issues, problems related to sociability had a significant part in a decrease in the use of a community service (Brandtzæg & Heim, 2008).

2.3.1. Lack of interesting people and quality content

In their article, Brandtzæg and Heim (2008) note that the most common reason for a decline in the use of an online community site is a lack of friends or other interesting people. As they explain, people want to be a part of a group of peers who have similar values and mutual respect. Brandtzæg and Heim (2008) also propose solutions for creating such groups online. In addition to simply creating small focused communities or groups within communities, they state that a viable solution may also be making inviting friends to a group or community easier.

According to Brandtzæg and Heim (2008), the second most frequent reason to stop using an online community site is low quality content or too few updates. As they point out in their article, this problem can be linked to the lack of interesting people in the user's eyes. Content posted by people who are notably dissimilar may not be interesting or relevant to the user (Brandtzæg & Heim, 2008). Brandtzæg and Heim (2008) also note that many of the participants of the study stated that they got bored easily. Therefore, in order to maintain the users' interest, the online community has to feature updates with interesting and varied content (Brandtzæg & Heim, 2008).

2.3.2. Privacy

In order to create interpersonal trust, members have to share some information about themselves (Feng et al., 2004). Friends may be given access to more information about the user but the online community site's options should enable the user to hide this information from the rest of the community.

One potentially serious problem related to privacy is anti-social behaviour within the online community. Users can become subject to online bullying or harassment, which quickly becomes a serious problem unless users can report or block users who behave inappropriately. Otherwise, the harassed user may have to either create a new profile or leave the community completely. Both options may however be out of the question if the user, for example, has a large number of friends in the community. A study conducted by Brandtzæg and Heim (2008) found that harassment or bullying was the reason behind 9 percent of cases that led to the person to using an online community less or stopping altogether. An even more serious problem can be harassment in real life caused by an unwanted person being able to access personal information about the subject person.

Brandtzæg and Heim (2008) state that according to their research, online communities that allow members to use nicknames instead of their real names are more likely to lead to bullying. They also put forth the notion that harassment is related to the community or its theme rather than a specific person. This viewpoint would signify that it is the community site's designers' responsibility to implement appropriate functions to prevent harassment or block members who bother others.

In their study, Schrammel et al. (2009) found that users of different online sites disclose sensitive information relatively freely. Whilst this openness has its benefits, it can also lead to harassment or even more serious data misuse such as identity theft (Fraser et al., 2008). On the other hand, Schrammel et al. (2009) also state that there are significant differences in the users' behaviour and needs depending on the type of community. Their study suggests that users in the community usually provide merely the information that is required to achieve the apparent maximum benefits of belonging to the community.

In addition to anti-social behaviour, users can face less serious problems related to privacy. Members of the community who do not seek new contacts may be contacted by others due to the public information in their profiles. Whilst occasionally received

messages can be quite easily ignored, repeated attempts by different members of the community may irritate the users. This problem gives further credence to the notion that users should be allowed to hide information they do not deem necessary for others to see or even set their profiles as visible to friends only. As Lenhart and Madden (2007) explain, there are some people who share almost everything online and others who refuse to share information about themselves in any circumstances. Online community sites therefore need to be designed in a way that enables all kinds of users to communicate at the level they prefer.

2.3.3. Lurking

In their article, Joon et al. (2007) state that according to their research, the posting activity stimulant is different from the viewing activity stimulant. Based on this they propose that posting and viewing in online communities should be considered as separate choices that require different motives. This means that lurkers and members who take actively part in the discussions have different needs in the online community.

According to Preece et al. (2004), even busy online communities include more lurkers than actively posting members. Many see lurkers as a problem or a sign that the community has problems encouraging participation. For example, Kollock and Smith (1996) regard lurkers as free-riders who ask questions and seek information without giving anything back. They see lurkers as a challenge that limits the community's potential to produce proper interaction. Preece et al. (2004), on the other hand, note that there are many reasons for lurking apart from merely exploiting the community to gather information. According to Preece et al. (2004), there are circumstances in which lurkers would like to post but are hindered by various factors. The most common reason for not posting was that the lurkers did not feel a need to post (Preece et al., 2004). Preece et al. (2004) point out that this may in some cases also be caused by the lurkers' fear of having their contributions mocked.

Despite defending lurking in online communities, Preece et al. (2004) nevertheless admit that according to their research, lurkers were less satisfied with their community experience than members who posted. Therefore, it would arguably be beneficial for all parties if lurkers could be better encouraged and motivated to take part in the community's discussions. In fact, Preece et al. (2004) discovered that some members simply needed more time to get to know the community through lurking before they became comfortable enough to participate.

2.4. Motivating members to participate

Online communities often rely on the users to create new content and discussion. Therefore, motivating people to participate in the activities of the community is an important task. People have various motives for joining communities but these motives do not necessarily lead to actual participation in the community's operation and

discussions. For example, lurkers may have different motives than users who actively take part in discussions.

Different means can be used to motivate community members to participate. Some methods are simple and straight-forward, such as rewarding active users. On the other hand, focusing on creating a welcoming and open community feel may provide better results.

2.4.1. Rewards

Rewards are a simple way of trying to encourage people in the community to participate. There are, however, significant differences in opinions about the effectiveness of using rewards.

A survey carried out by Antikainen and Väätäjä (2008) in relation to open innovation communities found that rewards for participation were essential for the respondents. In addition, the results show that recognition according to the quality of ideas is important (Antikainen & Väätäjä, 2008). Respondents also appreciated public acknowledgement for rewarded users (Antikainen & Väätäjä, 2008).

However, some experts warn that extrinsic rewards are not always beneficial. Deci et al. (1999) have studied the effects of extrinsic rewards on intrinsic motivation. They note that tangible rewards have a clear negative effect on intrinsic motivation, even if they are used as indicators of good performance. They also state that although rewards are widely advocated, they can lead to a lack of self-regulation among people. Deci et al. (1999) also put forth the view that rewards that focus on short-term effects can have considerable negative long-term consequences. In other words, rewards for taking part may initially increase participation but after a while, the rewards may lose their effect and even discourage users from taking part.

2.4.2. Uniqueness of contribution

Beenen et al. (2004) state that according to their research, people are more likely to contribute to a group task if they see their contribution as unique. However, they also note that they were unable to find any online communities that provided feedback based on the uniqueness of the users' contributions (Beenen et al., 2004). In their own research, Beenen et al. (2004) experimented with simple email messages that emphasized the uniqueness of potential contributions and found that this led to an increase in contributions. Furthermore, a study conducted by Harper et al. (2007) concludes that emphasizing uniqueness in personal invitations sent to users increased participation in online discussions.

Ludford et al. (2004) carried out similar research and their research not only supports the claims of Beenen et al. (2004) and Harper et al. (2007) but also states that forming groups with diverse perspectives leads to increased participation. This indicates that administrators of online communities can increase member contributions without directly contacting users and instead by manipulating group formation. It should be

noted that in this case manipulation does not mean administrators moving users into groups, but rather creating guidance methods that usher users to find groups they might be interested in.

2.4.3. User profiles

There are also less intrusive ways of encouraging participation. Lampe et al. (2007) discuss the possibilities for creating discussion with the help of user profile elements. According to their research using the popular online community Facebook, common referents included in the profile seem to have a larger effect on the number of online friends than information about personal likes or dislikes (Lampe et al., 2007). Lampe et al. (2007) therefore suggest that an online community's search features should include the possibility to search by common referents such as same home town or job type.

Farrell et al. (2007) have studied so called people-tagging as a method for managing contacts. This method relies on short textual descriptions, tags, for describing members of the community (Farrell et al., 2007). These tags can be added by either the member herself or other members (Farrell et al., 2007). Farrell et al. (2007) note that in their research, a vast majority of users was pleased with the tags others gave them. Nevertheless, Farrell et al. (2007) also point out that tagging has some drawbacks such as tag name collisions, possibly offensive tags and tags becoming obsolete over time. Despite the issues, they see great potential in people-tagging as a tool for helping community members to find people. In addition, Farrell et al. (2007) found that tagging helped distribute the work of maintaining a user's profile from the user to other members of the community who benefit the most from keeping the profile up-to-date. This means that the user's profile reflects the image his current contacts have of him or her. Respectively, the user's tags can give potential new contacts a better understanding of not only what kind of work and hobbies she is involved in but also what the person is actually like.

2.4.4. Sense of community

Arguably the most effective way of encouraging discussion between members may be to create a sense of community. Blanchard and Markus (2004) state that all online communities do not actually have a sense of community. In their research, they based their definition of sense of community on the framework described by McMillan and Chavis (1986). This framework consists of four factors: feelings of membership, feelings of influence, integration and fulfilment of needs and shared emotional connection (McMillan & Chavis, 1986). Blanchard and Markus (2004) state that with small modifications this framework can be applied to online communities which do not necessarily have any physical connection between members.

Blanchard and Markus (2004) note that simply building a virtual meeting place does not automatically result in a community. They use the term "virtual settlement" to describe a meeting place that has not developed a sense of community. This term seems

accurate since it conveys the sentiment that the meeting place has accumulated people who have similar needs but nevertheless have not created a real sense of community. In other words, people have gathered in the same place to for example collect information but have not been able to connect with each other. As Blanchard and Markus (2004) point out, understanding the transition from a "virtual settlement" to a community and maintaining sense of community over time are very important issues in the development of online communities. On the other hand, they also note that in some cases, particularly in commercial use, a "virtual settlement" may very well suffice if the personal involvement in an online community is deemed too high (Blanchard & Markus, 2004).

One way of trying to create a sense of community is to stimulate social engagement between members. At the same time, it can also be one of the major challenges in building an online community. Millen and Patterson (2002) put forth three methods for supporting social interaction in online communities: using system design elements such as notification services, using certain criteria for selecting community members and supporting certain topics of discussion. According to their research, these methods have a positive effect on social interaction between community members. In their study, for example, not only actively participating users but also lurkers were almost twice as likely to return to the community site when they received a notification. Millen and Patterson (2002) also noted that a prolonged period of community inactivity led to a drop in participation. Whilst this observation is not surprising, it does reinforce the need for administrators of online communities to find ways of keeping up discussion during quiet times.

Selecting community members using certain criteria may not initially seem productive since more members presumably lead to more interaction. Nevertheless, Millen and Patterson (2002) conducted a survey in order to find out how the members' interests correlated with the amount of interaction. Whilst the research gave some predictable results, there were also surprises such as the fact that knowledge about people's attitudes toward technology did not help predict their behaviour in the online community (Millen and Patterson, 2002). In addition, members who took part in external groups did not necessarily use features within the community that had been designed to support groups (Millen and Patterson, 2002). These observations show that member selection might increase interaction within the community. Members can be, for example, grouped together according to not only their interests but also their characteristics related to participating in social activities. These characteristics may lead to an increase in interaction between group members even if their interests differ.

2.5. Business aspects of online communities

Since the emergence of online communities, many corporations have attempted to use them for commercial gain. As Lewis (2008) points out, there has nevertheless been a lack of research into the commercial possibilities of online communities. IBM was one of the first large corporations that started to develop software with a more open

development approach that included communication with users through an online community (Lewis, 2008).

In their research, Rood and Bruckman (2009) found that active users of a company online community formed a strong relationship not only with others in the community but also with the company brand. In addition, they found that many users who visited the communities just to find information ended up taking part in the community and developing friendships with other members. This shows how beneficial commercial online communities can be not only to corporations but also to the people taking part. The following subchapters include further information about the business potential of online communities.

2.5.1. Supporting product or service development

An interesting part of using online communities for business use is communicating with users about products and services in development. Through an open community, the company may have access to a large number of potential users for the product or service. These people are therefore ideal for gathering information about what the product or service should be like. Community members can help not only in listing useful features but also in testing the actual product during development. For example, in the research that was covered by Lewis (2008), data gathered from a community provided IBM's developers with information about their product that would be more difficult to gather through usability tests. However, he also points out that despite the consistent results in their research, community feedback was not intended to replace more traditional usability tests in a laboratory setting.

As Nambisan (2002) suggests, members of a community taking part in development of a new product or service can be given access to restricted areas or other non-monetary rewards. This will potentially keep the participants motivated to keep active throughout the development process. Nambisan (2002) also brings forth some problems related to using current customers as resources. For example, he notes that existing and potential customers may have different needs. He also warns that involving customers in idea generation may lead to unimaginative products based on products the customers have previously used. On the other hand, however, Nambisan (2002) notes that despite the challenges, using customers can be a significant resource in developing products.

2.5.2. Attracting new customers

As well as helping in development, online communities can also be used in the marketing of products and services. A popular community gives the company a good chance to introduce new products that users might want to buy. In addition to existing members, the community may attract new people who are interested in the company or its products and want to gain access to additional features or to find news about upcoming products.

Smith et al. (2005) note that in their research, a large portion of online consumers easily adopt peer recommended options regardless even of the recommender's profile and level of expertise. An explanation for this may be that the amount of available information about different products simply overwhelms the customer which leads to a need to find a more compressed and relevant source of information (Smith et al., 2005). Nevertheless, Smith et al. (2005) also discovered that customers were more discerning about how much trust they placed in peers. This is not a surprising result since peer evaluations are always somewhat subjective regardless of their information content. However, peers may be able to recommend products to others better based on their needs. A potential future customer can describe their needs related to a certain type of product, and friends or complete strangers can offer opinions on whether the product suits the person's needs.

2.5.3. Customer satisfaction and loyalty

In addition to collecting data from users, online communities can also be used to increase customer satisfaction. An online community site can include features that can be used alongside a physical product. Such features can enable the users to do new things that would not be possible using the product alone. If engineered properly, these features may become so important to a user that when the product breaks or becomes outdated they buy a new similar product that is compatible with the same online community site.

Swamynathan et al. (2008) studied the impact of communication through an online community on business transactions. Their research indicates that partners who were connected through the community were significantly more satisfied in their transactions. This suggests that encouraging users to connect with each other or the company not only gives the online community a true community feel but may also increase the number of business transactions. This, in turn, can create more revenue for the company and increase overall customer satisfaction.

Kim et al. (2004) note that capturing online customer loyalty is difficult since customers' needs change constantly. Based on their study about web-based travel companies, they suggest that customer loyalty can be measured by using an online community as a tool to gather information about customers. Their measure for loyalty is the frequency of visitation to the community per week which featured as a question in the survey filled in by a total of 351 respondents. Kim et al. (2004) also studied how customer loyalty can be increased with the help of such a community. Based on their study, they recommend stimulating members' participation using chat rooms and bulletin boards for informal discussion related to the community and the company's products. Kim et al. (2004) state that based on their results, web-based companies that adopt online communities earlier are able to attract potential customers who become loyal whilst companies failing to do so will not be in the frontline in globally competing markets. As a simple application for increasing loyalty, Kim et al. (2004) bring forth the

example of a web-based travel company that could develop an online community with highly automated communications to communicate with customers.

According to Bolchini et al. (2009), the quality of web communication depends on several factors, one of which is how effectively intended brand values are conveyed to the users. This brand value can consequently increase customer loyalty. In the case of an online community created by a company, the service's purpose should not be limited to giving users support and luring new customers. As Brandtzæg and Heim (2008) state, the most important purpose of a commercially produced online community is to instill users with a feeling of loyalty to the company. This loyalty will hopefully also manifest itself as increased revenue through repeat business.

2.5.4. Customer support

Many companies nowadays provide web-based customer support as a part of their homepage used to promote their products and services. Furthermore, an online community can be created to provide users with more tailored support than traditional web services. At the same time, web-based support can also be more cost-effective than phone lines both for the company and its customers.

As Negash et al. (2002) point out, in the case of web-based customer support, companies or other system providers need to consider information quality features in more detail. They state that traditional customer support systems can be more easily evaluated using printed reports about the customer support provided. In an online community, further evaluation about the quality of the information provided could be carried out by customers. For example, a rating or commenting system used by community members can help the system providers see which information is relevant to customers and how it could be improved further. This can give the provider tangible indicators for the quality of information and help in the ensuing development of support features.

In addition to the company providing support to its customers, online communities can also be used to bring together users of a product who can provide support to each other. A simple way of enabling this is to implement a wiki as a part of the online community. However, whilst a wiki may provide users with solutions to problems, it can also cause problems for the community. As Forte and Bruckman (2007) note in their research, the administrators of a wiki may face the problem of not having enough control over content. The wiki may, for example, include incorrect or outdated information about products or services. Forte and Bruckman (2007) bring forth suggestions that may help to combat the problem, such as implementing an approval process for new content.

2.5.5. Creating revenue

In some cases, the online community needs to create revenue that can be used in the upkeep and development of the service. This is a more important issue for communities

that are not backed by corporations, but commercial services may also want to generate additional income. As Iriberri and Leroy (2009) list, online communities have several options to fund their activities, such as membership fees or advertising.

Advertising is perhaps the most popular form of funding as it does not obligate members to spend money on the community service. Instead, users are shown adverts and the community's administrators receive income based on the popularity of the service and how often users follow adverts placed on the site. Even further benefits can potentially be achieved using targeted marketing based on the users' preferences.

2.6. Sociability in user experience

Hassenzahl (2008) describes in his article that in addition to merely accomplishing tasks, technology also has more experiential aspects. According to him, these include insight, pleasurable stimulation and social exchange. In regard to social exchange, he and his colleagues also state in an earlier article that people have a need to communicate and express themselves through objects (Hassenzahl et al., 2001). Thus, depending on the product or service, it can include social dimensions that are important to understand when considering the overall user experience.

Overall, sociability is quite new a concept and therefore there is relatively little available research data about its part in the overall user experience. There have, however, been countless examples of integrating features into personal devices or services in order to create new types of social experiences.

Constas and Papadopoulos (2001) discuss the prototype of a wearable computer that aims to empower users to generate instances of sociability through the use of the device. Although their article focuses on the technical aspects of the device, they also note that technology is becoming increasingly central to human expression and interaction. They bring forth the idea of separating social functionality in a device from non-functional characteristics that are designed to instigate a psychological attachment to the device. Although both aspects contribute to the user's overall experience, they seem to have different effects.

According to Constas and Papadopoulos (2001), non-functional characteristics that can be promoted as being social merely generate emotional appeal to the device, whereas true social functionalities open up new possibilities for social experiences with other people. As they note, these social functionalities involve a much more demanding design process but they empower the user to generate and experience new social situations with the help of the device.

3. METHODS

This chapter includes description of the fitness-related web services that were studied. The chapter also describes the heuristic evaluations, interviews and the diary study carried out in order to gather information for the study.

This study is in close relation to the PROFCOM project (Malinen, 2009), carried out by the Unit of Human-Centered Technology at Tampere University of Technology and the Technology Business Research Center at Lappeenranta University of Technology. In addition, this study is also connected to the development project of Suunto Movescount that the Unit of Human-Centered Technology at Tampere University of Technology took part in.

3.1. Online communities studied

For the purposes of this study three fitness-related web services were chosen. These services were Suunto Movescount, Nokia Sports Tracker and Polar Personal Trainer. The three were chosen because they were deemed to feature social features and have similar target audiences. In addition, these services were known to have Finnish users who would potentially be able to take part in interviews.

During the study, Suunto Movescount was tested on a server hidden from the public and all test users of the service were interviewed. Nokia Sports Tracker and Polar Personal Trainer, on the other hand, were public and a small share of their users took part in interviews. Other public fitness-related web services were initially included in the study but left out due to a lack of available Finnish interviewees.

3.1.1. Suunto Movescount

Suunto Movescount (2009) describes itself on the web site as follows: “A sports community where every move counts. Plan, manage and store your sports activities. Explore and enrich your diary with tags and applications. Share your experiences with others.” This description gives some insight into the purpose of the service. Suunto Movescount’s main features revolve around storing sports activities, known as moves on the site and sharing them with other users. In future references to moves, the term “workout” will be used for the purpose of consistency with the two other services studied.

In the future, users can upload workouts from compatible Suunto devices including route and heart rate data. These can also be input manually if such a device is not available. Workouts can also include further manual input, such as information

about weather, feeling and informal description about the workout. In addition, pictures and videos can also be associated with workouts. The service also enables users to examine statistics about their training.

Whilst the service is mainly designed for storing workouts, it does also include social features that enable users to form new personal contacts and communicate with each other. Like-minded people can also form groups around a matter of interest, for example, a particular sport. Connecting with other users and following their training is meant to motivate the user's own training. Users can share their workouts with others and commenting on them is also possible.

3.1.2. Nokia Sports Tracker

Nokia Sports Tracker (2009) describes itself as follows on the web site: "Nokia Sports Tracker is a GPS-based activity tracker that runs on compatible Nokia mobile devices. Information such as speed, distance, and time are automatically stored in your training diary. On this site you can store and share your workouts and routes." As mentioned in the description, the service is mainly intended for users with compatible Nokia mobile devices. When using such a device, other users can even follow the workout in real time. Route information can, however, also be submitted manually. Since Nokia Sports Tracker utilizes GPS tracking, the emphasis of the service is on activities that can be monitored using GPS, such as running and cycling. Each workout must have an enclosed route which means that for example weight training cannot be logged using the service.

The main purpose of the service is to store users' workouts. The workouts consist of data that can be input manually or gathered using a compatible Nokia mobile device, such as route and heart rate information. In addition, the user can input informal comments about the workouts or enclose pictures taken during the workout. If using a compatible Nokia mobile device, the service will also automatically include information about music listened to during the workout. Workouts added to the service can be defined as private or alternatively, the user can share them with friends, a group the user belongs to or all users of the service. A public workout can be shared with people outside the community using an individualized URL.

Nokia Sports Tracker can also be used to find new friends or training partners. In addition, users can form groups around a matter of interest, for example, a certain sport. Members of a group can share workouts with each other without having to make them public. Discussion related to the group can be carried out using a dedicated page, although it can be read by all users.

3.1.3. Polar Personal Trainer

Polar Personal Trainer (2009) describes itself as follows on the web site: "Whatever your sport, whatever your goal and whatever your level. This is for you who want to train right, follow your progress and have fun with friends." As the description implies,

the service is intended not only for storing training results but also providing help for planning training.

The main purpose of the service is to store the user's training and strength training results along with general fitness data. Data can be uploaded to the service using a compatible Polar training computer or input manually. In addition to basic information such as duration and calories used, the user can input additional notes about the training. The service provides statistics about the user's training that help follow development.

In addition to logging completed training, users can create training programs, strength training workouts and training targets that can also be uploaded to a compatible Polar training computer. The service also includes training programs and strength training exercise instructions that users can utilize in their own training.

Although the service focuses on individual training, it also includes some social features. Users can take part and create challenges that gather a group of people to strive toward a goal together or whilst competing with each other. During the challenge, participants can communicate using a dedicated page. This discussion is seen only by participants of the challenge.

Apart from the challenges, users can try to find new friends with the help of a simple user search or the adjacent Polar Forum. The service also features a private messaging system.

3.1.4. Comparison of the web services studied

The main focus of all three services studied is to keep track of one's own training. In addition, all have some kind of social features. For example, sharing workouts to other users is possible in all three services. Apart from these two features mentioned, the services have differing solutions for maintaining a training diary and communicating with other users.

In Suunto Movescount and Nokia Sports Tracker, route information plays an important part in the workouts whilst Polar Personal Trainer has no possibilities for including the route. Instead, Polar Personal Trainer is suited to logging more diverse training, such as weight training in addition to sports that involve route information. Polar Personal Trainer also has more versatile options for logging general health information.

Polar Personal Trainer also has a different approach to communicating with other users. Whilst the other two services rely on commenting on other users' workouts or profiles, Polar Personal Trainer includes a forum and a private messaging system.

Suunto Movescount and Nokia Sports Tracker include the possibility of creating private or public user groups. Whilst Polar Personal Trainer does not have an identical feature, users can still create temporary groups around a challenge.

The core features of the services are quite similar but each of them also has some features not available in the other two. Therefore, whilst the services seem like

direct alternatives to each other, the user's needs in regard to logging training data or communicating with other users can make only one of the services suitable.

It should be noted that all three services are backed by corporations that produce equipment that can be used together with the services. Therefore, the choice of equipment can have a significant impact on choosing the service than the features available. All services are nevertheless designed in a way that does not necessitate the user owning a compatible device.

A more detailed list of the features available in all three services can be found below in Table 1. The status of Suunto Movescount's support for GPS and heart rate data is "pending", meaning that the features are not operational during this study.

Table 1: Features available in the services

Feature	Suunto Movescount	Nokia Sports Tracker	Polar Personal Trainer
Logging workouts	X	X	X
Logging routes	X	X	
Support for GPS data	Pending	X	
Support for heart rate data	Pending	X	X
Logging additional health data			X
Sharing workouts only to friends	X		X
Sharing workouts publicly	X	X	
Real-time tracking		X	
Discussion forum			X
Private messaging			X
Commenting on other users' content or profiles	X	X	
Creating and joining groups	X	X	
Taking part in challenges			X
User search		X	X
Finding training partners		X	

3.2. Interviewees

As a part of the study, a total of 20 interviews were conducted. The interviewees featured 10 users of Suunto Movescount, seven of Nokia Sports Tracker and three of Polar Personal Trainer. The interviewee's ages ranged from 24 to 45 years, the average being 32.2 years.

Interviewees studied or worked in various industries, although there is a clear emphasis on technical industries. A listing of the interviewees' basic background information can be found on the next page in Table 2.

Table 2: Basic information about interviewees

	Suunto Movescount	**Nokia Sports Tracker**	**Polar Personal Trainer**	**In total**
Participants	10	7	3	20
Male participants	5 (50 %)	6 (86 %)	2 (67 %)	13 (65 %)
Age range	23 - 45	24 - 31	25 - 36	23 - 45
Students	3 (33 %)	1 (14 %)	2 (67 %)	6 (30 %)
Technically oriented profession/industry	4 (40 %)	7 (100 %)	2 (67 %)	13 (65 %)

3.3. Procedure

During the study, four different methods were used to gather data about the services and their users. The methods are listed below in Table 3. As can be seen from the table, the diary study was the only method that was only used in the case of Suunto Movescount.

Table 3: Methods used for collecting data

Method	**Suunto Movescount**	**Nokia Sports Tracker & Polar Personal Trainer**
Heuristic evaluation	X	X
Interviews	X	X
Diary study	X	

All three services were subject to heuristic evaluations at the start of the research. The heuristic evaluations aimed to find issues related to sociability.

At the beginning of the service's testing period, the ten test users of Suunto Movescount were invited to meetings in which they were given instructions for the testing period. They also filled in a questionnaire featuring questions about their background and interests regarding fitness and online communities. A similar questionnaire, without questions that were only applicable in the case of Suunto Movescount, was filled in by users of Nokia Sports Tracker and Polar Personal Trainer at the beginning of the interview.

Test users of Suunto Movescount used the service for approximately three weeks. During this period, they filled in a diary that featured questions about their use of the service. The diary study is described in more detail in Chapter 3.7. Users of Nokia Sports Tracker and Polar Personal Trainer had all used their service of choice for at least six months before the interview. Hence, they were not asked to prepare in any way for the interview beforehand. In the case of Suunto Movescount, interviews with test users were carried out after the testing period.

At the end of the interviews, each interviewee filled in a questionnaire about his or her user experience and views on sociability when using the service. More detailed descriptions of the questionnaires can be found in Chapter 3.5.

3.4. Heuristic evaluation

One of the main focuses of this study is whether heuristic evaluation can be used to evaluate sociability in fitness-related web services. Using three separate lists of sociability heuristics, the evaluation team sought and assessed issues related to sociability.

The heuristic evaluations of Nokia Sports Tracker and Polar Personal Trainer were carried out in October 2009 by the author of this thesis. As Nielsen and Molich (1990) note in their article in regard to usability, a single evaluator typically finds less than half of the problems. Using only one evaluator to evaluate sociability in Nokia Sports Tracker and Polar Personal Trainer therefore was not an ideal arrangement. The evaluation was nevertheless believed to produce sufficient results for the purposes of this study. The chances of the evaluator finding all major sociability problems were increased somewhat by carrying out two separate heuristic evaluations of both services. These evaluations were carried out with a week in between using all three lists of heuristics and finally combining the results. This arrangement was possible as neither Nokia Sports Tracker nor Polar Personal Trainer featured any notable changes between the two evaluations. Although the arrangement presumably did not produce the same results as having several evaluators, it did increase the number of problems found.

The heuristic evaluation of Suunto Movescount was carried out by a team comprising two researchers from The Unit of Human-Centered Technology at Tampere University of Technology, and the author of this Master's thesis. All participants had previous experience in conducting heuristic evaluation as a part of academic research or, in the case of the author, through taking part in usability-centred education provided by The Unit of Human-Centered Technology at Tampere University of Technology.

Suunto Movescount's heuristic evaluation was initially carried out individually by all three team members. Each evaluator performed a heuristic walkthrough of the entire service using the heuristics listed in Chapter 3.4.1 and logged all problems and positive features related to sociability. In addition, each problem's severity was evaluated using a scale that can be found in Chapter 3.4.2.

After the evaluation had been carried out, all the results related to Suunto Movescount were combined and discussed by the evaluation team and representatives from Suunto. Finally, all the problems' severities were re-evaluated according to the opinions of all parties involved. Results related to Nokia Sports Tracker and Polar Personal Trainer were summarized by the author of this thesis.

The heuristic evaluation of Suunto Movescount was performed using revision 3670 of the service. This revision was released for testing purposes the 12th of September 2009. The results of the heuristic evaluation may not apply to subsequent

revisions of the service. During the evaluation, some sections and features of the service were missing or out of order due to ongoing development. All resulting problems were therefore ignored during the evaluation.

The heuristic evaluation of Polar Personal Trainer was performed using version 3.3.5.2 of the service. In the case of Nokia Sports Tracker, the evaluation was carried out using the version of the service in use on the 2nd of October 2009. Like Suunto Movescount, these services may also have changed after the evaluation making some observations obsolete. The basic information about the heuristic evaluations carried out can be found below in Table 4.

Table 4: Heuristic evaluations carried out

Service	Version / Revision	Evaluation performed	Number of evaluators
Suunto Movescount	3670	September 2009	3
Nokia Sports Tracker	N/A	October 2009	1
Polar Personal Trainer	3.3.5.2	October 2009	1

3.4.1. Heuristics used

The heuristic evaluation of sociability issues was carried out primarily using heuristics developed in the PROFCOM project (Malinen, 2009), carried out by Unit of Human-Centered Technology at Tampere University of Technology and Technology Business Research Center at Lappeenranta University of Technology. The PROFCOM heuristics can be found in Appendix 1. In addition, Nielsen's (2006) participation guidelines and a collection of Preece's (2000, 2004) sociability heuristics were used in the evaluation. Nielsen's participation guidelines and the collection of Preece's sociability heuristics can be found in Appendix 2 and 3, respectively.

Table 5: Heuristic lists used in heuristic evaluation

Heuristic list	Appendix	Identifiers	Suunto Movescount	Nokia Sports Tracker	Polar Personal Trainer
PROFCOM sociability heuristics (Malinen, 2009)	1	[Malinen #]	X	X	X
Nielsen participation guidelines (Nielsen, 2006)	2	[Nielsen #]	X	X	X
Preece sociability heuristics (Preece, 2000, 2004)	3	[Preece #]	X	X	X

The heuristics used in the evaluation of the different services can be found in Table 5 on the previous page. All heuristics have individual identifiers that help in connecting the results of the heuristic evaluation to the corresponding heuristics. The formats of these identifiers are also described in Table 5.

3.4.2. Severity of problems

After the heuristic evaluation was carried out, each problem was given a rating of severity. This rating system is described below in Table 6. The focus in heuristic evaluation was naturally on severe and moderate problems, but all potential problems were noted. In addition to problems, features supporting sociability were also documented.

Table 6: Severity ratings for heuristic evaluation

Severity rating	Description
3	Severe problem. Prevents use or leads to significant loss of data or time. Requires immediate correction.
2	Moderate problem. Hinders use but can be bypassed. Should be corrected in the next version of the service.
1	Minor problem. Does not significantly hinder use. Should be corrected if possible.

Severe problems were issues that prevented users from using a feature or posed some type of significant risk for the user. This included, for example, privacy problems that could have lead to the user's personal information being compromised. At the other end of the range, minor problems did not have a significant effect on sociability but they may have reduced the pleasure of using the service.

3.5. Questionnaires

All interviewees were asked to fill in a background information questionnaire. Test users of Suunto Movescount filled in the questionnaire before the testing period. This was done during the initial meetings when test users were given their individual login information. Users of Nokia Sports Tracker and Polar Personal Trainer filled in the questionnaire at the beginning of the interview. The questionnaire, which can be found in Appendix 4, included general questions about the test user's background and interests in regard to fitness and online communities.

All interviewees also filled in another questionnaire that featured questions related to user experience. Suunto Movescount's test users filled in the questionnaire at the beginning of the final interview. Users of Nokia Sports Tracker and Polar Personal Trainer, on the other hand, filled in the second questionnaire at the end of the interview.

This was simply so that interviewees did not have to fill in both the background and user experience questionnaires in one go.

The user experience questionnaire was used to gather information about the interviewees' impressions and experiences of the service and, in the case of Suunto Movescount, whether or not it matched the test users' preconceptions. Users of Suunto Movescount were also asked what they wanted to achieve using the service and whether they succeeded in completing these goals.

The user experience questionnaire filled in by all interviewees also featured questions about issues related specifically to sociability, such as taking part in the community's discussions and inspiring users to add content. The questionnaire can be found in Appendix 5.

3.6. Interviews

A total of 20 interviewees took part in the interviews conducted for this study. 10 of the interviewees were test users of Suunto Movescount who had been recruited by Suunto. In order to gather sufficient data for comparison, another 10 interviewees were recruited from public fitness-related web services that include social features. These 10 interviewees were found by leaving invitations on various fitness-related forums and mailing lists.

At the beginning of each interview, the interviewee was asked to sign an agreement for recording the interview. The agreement also included a pledge from the interviewer that only researchers taking part in the study would gain access to the material and the interviewee's identity would be kept secret.

Interviews with Suunto Movescount's test users were carried out by two researchers from The Unit of Human-Centered Technology at Tampere University of Technology. The author of this thesis took part in one of these interviews. The author of this thesis also carried out all the interviews with users of Nokia Sports Tracker and Polar Personal Trainer. All interviews were recorded using a digital voice recorder.

The interviews with users of Suunto Movescount also included a usability testing section that is not covered in this thesis. The test users' comments related to using the service during the usability tests are, however, included among the results of the interviews.

3.6.1. Topics discussed in interviews

The purpose of the interviews was to gain a comprehensive understanding of the way the interviewees use the different services. Therefore, the interview featured various topics related to the use of the services. In addition to subjects related strictly to sociability, interviewees were also questioned about their general use of the service in order to clarify how important a part sociability plays in the overall user experience. The complete list of questions used in all the interviews can be found in Appendix 6.

At the beginning of the interview, interviewees were asked some background information about using the service in question. Users of Nokia Sports Tracker and Polar Personal Trainer were asked to give a brief history of when they had started using the service, how often they normally used it and what they used it for. Correspondingly, test users of Suunto Movescount were asked general questions about how the testing period had went and whether the service matched their expectations.

Next, interviewees were asked about their opinions on the features of the service they used. Interviewees told, among other things, what types of features they had used, which features worked well and which were unsatisfactory. In addition, possibly unnecessary or missing features were also discussed.

Content was also discussed in length during interviews. Interviewees were asked what kind of content they add themselves and, comparably, what kind of content they are interested in. Another important question was what motivated the interviewee to add new content to the service he or she used.

As the focus in the interviews was on sociability, interviewees were naturally asked questions about communication with other users. These included inquiries about if and how interviewees had communicated with others during the use of the service. The questions also aimed to find out what kind of communication and social features interviewees wanted.

Another sociability-related subject discussed during interviews was privacy issues. The questions were intended to find out how much the interviewees told or would have liked to tell other users about themselves. For example, interviewees were asked whether they kept their profiles private or public and what kind of information the profiles included.

3.7. Diary study

A diary study was conducted as a part of the test use of Suunto Movescount. All ten interviewees who took part in testing the service also took part in the diary study. The diary study was conducted in order to gather more information from the test users about their use of the service. With the help of the diary forms, users were able to describe which features they used along with problems they encountered whilst using them. This ensured that issues were documented immediately which reduced the risk that the information would be forgotten by the test users before the final interview.

The diary comprised two slightly different forms. The first form, included in Appendix 7, was filled in after the first time of use. After each subsequent time of using the service, the user filled in a new instance of the second form that can be found in Appendix 8. The study was conducted in this way in order to gain an understanding of how the test users' impression of the service changed over time and repeated use.

The test users were asked to document all problems and other observations they noted during the time of use in question. This helped in drawing conclusions of how serious the problems were and how often they affected the user's actions. The diary

forms also encouraged the test users to describe their general perceptions about the service and its purpose. This information was then used to assess whether the service gave users the wanted impression or not.

The diary study was also used in order to find out how the test users used the service. An important aspect of this was whether the test users wanted to use social features and connect with other users. Although these issues were also covered in the final interviews, the diary study helped to evaluate how the users' interest in different social features possibly developed during the testing period. Subsequently, this aided in assessing whether the service encouraged users to form a community.

The forms of the diary study consisted of open questions that the test users could answer in an informal manner. Users were, however, given instructions to grade the severity of a maximum of three problems encountered during the time of use in question. The severity of how much the problem bothered the test user was graded on a three-tier scale on which the number 1 stood for "slightly" and the number 3 for "considerably".

At the beginning of the final interviews, the test users returned the diary study forms they had filled in during the testing period. The diary was briefly discussed as a part of the interview to clarify any unclear matters related to it.

4. RESULTS

This chapter includes all the relevant results gathered from heuristic evaluations, interviews and diary studies. This chapter also contains background information about the participants of the study gathered during interviews.

In addition, the chapter includes results related to the validation of sociability heuristics. These results include comparison between observations from heuristic evaluation and the results gathered from interviews and the diary study.

4.1. Heuristic evaluation

The results in the following subchapters are grouped according to the themes that were deemed by the evaluators to have had significant negative or positive impacts on the sociability of the service in question. Each problem or feature that supports sociability includes the information about which heuristic it is related to in square brackets. Each heuristic has its own identifier according to the lists name and the number of the heuristic. The formats of these identifiers are described in Table 5 in Chapter 3.4.1.

Unless stated otherwise, each problem or feature supporting sociability was noted by one evaluator. In the case of Nokia Sports Tracker and Polar Personal Trainer, the whole heuristic evaluation was carried out by one evaluator. The heuristic evaluation of Suunto Movescount was performed by three evaluators and can therefore include observations made by more than one evaluator.

4.1.1. Suunto Movescount

Finding new contacts in Suunto Movescount is based on the information found in the users' profiles. However, these profiles currently feature very little information about the users as they can not be edited. Users are therefore unable to express themselves using their profiles [Malinen 1, Nielsen 3, Preece 7]. The profiles do not include any informal profile fields that the users could use to describe what they are like.

Although users have the chance to add comments, there are few possibilities for them to bring forth their expertise [Malinen 1]. They can not, for example, publish articles or other content related to fitness. This content could possibly help other users in their training and bring more vibrancy to the service, especially if there was a possibility to discuss and improve the content together [Malinen 5].

Another serious problem in Suunto Movescount is the difficulty of finding other users with similar interests [Malinen 3, Malinen 5]. The service does not include a user search. Instead, users can be browsed using filters based on the sports the users have

taken part in. These filters are not, however, very useful in finding like-minded people. For example, finding a new training partner in a specific area is difficult with the current options. In addition to browsing other users' profiles, another method for finding other users could be a discussion forum but Suunto Movescount does not feature one [Malinen 5, Preece 3].

Active users of Suunto Movescount do not currently receive any rewards for their effort [Malinen 7, Nielsen 4]. The possibility of commenting enables users to reward each other with encouragement but they can not, for example, comment directly on specific workouts or rate other users' comments [Malinen 5, Preece 4]. The service's administrators do not offer any rewards for adding content or comments either [Malinen 7, Nielsen 4]. This may discourage users from using the service and sharing content if they get the feeling that their content is uninteresting or unimportant to others. Suitable rewards based on quality and quantity of a user's content and comments may motivate users to further increase their input in the service [Nielsen 5].

Suunto Movescount does not include any prepared content added by developers or administrators that users could react to and discuss [Malinen 8, Preece 8]. Apart from the workouts added by users, the service does not feature constantly updated content. Furthermore, excluding currently non-operational features, there is no information about how the service is going to be developed in the future [Preece 9].

The lack of a discussion forum also causes some significant problems in Suunto Movescount [Preece 3, Preece 4]. Although there is a possibility to comment on other users' profile pages, the lack of a forum means that there are very limited possibilities for discussion.

Table 7: Suunto Movescount: Main problems found using PROFCOM heuristics

Heuristic	**Prominent problem**
Facilitate self-presentation and creativity in the service.	Users are unable to express themselves using the profile and there are few opportunities for them to bring forth their expertise.
Create a sense of social presence.	It is difficult to find other users with similar interests due to constricted profiles and discussion.
Support users' networking.	It is difficult to find other users with similar interests due to constricted profiles and discussion.
Reward active users and give recognition.	Active users do not receive any rewards for their effort.
Offer the content in a motivating way.	There is no prepared content users could react to.

Suunto Movescount also has many features that support sociability. For example, the service enables members of the community to form groups around matters of interest [Malinen 5]. A group has its own dedicated page that can be used for discussion and following other group members' workouts [Malinen 2].

Table 7 on the previous page includes the PROFCOM heuristics used in the heuristic evaluation along with the most significant problem related to each heuristic. All results gathered during the heuristic evaluation of Suunto Movescount can be found compiled in Appendix 9.

4.1.2. Nokia Sports Tracker

User profiles in Nokia Sports Tracker contain relatively little information. Subsequently, a user's profile does not give a proper perception of what the person is like [Malinen 1, Malinen 3, Preece 7]. This can make it difficult to find new contacts using the service.

There are only two ways of communicating with other members of the community. The first is to comment on workouts created by others. These comments can not, however, include any personal information. When sharing workouts, comments are visible to all friends, a specific group the user belongs to or the whole community depending on the privacy settings of the workout [Malinen 2]. The other way of communicating is to create or join a group and comment on the group's dedicated page [Malinen 5]. However, the group's page is always public and its comments can therefore be seen by anyone. This is a serious issue especially since the page's visibility to everyone is not mentioned when adding comments [Malinen 2, Preece 6].

Another serious problem in Nokia Sports Tracker is communicating with other users as the service does not include any kind of forum for informal discussion [Malinen 5, Preece 3, Preece 4]. Users also can not send each other private messages using the service [Malinen 5].

Finding a new training buddy is difficult when using just the search function as help. Finding suitable users this way is cumbersome because the search function requires that the user knows the other person's user name, real name or email address [Malinen 5, Preece 4]. This means that the users have had to form some sort of contact somewhere else.

Nokia Sports Tracker does not include any prepared content added by developers or administrators that users could react to and discuss [Malinen 8, Preece 8]. Apart from the workouts added by users, the service does not feature new content. There is also no information about how the service is going to be developed in the future [Preece 9].

Nokia Sports Tracker also includes many features supporting sociability, such as forming groups around matters of interest [Malinen 5]. This eases communication between friends despite the problems related to the privacy of messages discussed previously. A group has its own dedicated page that can be used for discussion and following other group members' workouts [Malinen 2].

The service also clearly strives to create a communal feel [Malinen 3, Malinen 5]. Even if users do not have friends in the community, they can see other users' workouts on the community map [Malinen 3]. This gives users the feeling that the community is active as new workouts are updated on the map. "Community in a nutshell" also lists simple statistics about the members' activities during the current week which gives further confirmation that the community is vibrant [Preece 9].

Table 8 below includes the PROFCOM heuristics used in the heuristic evaluation along with the most significant problem related to each heuristic. All results gathered during the heuristic evaluation of Nokia Sports Tracker can be found compiled in Appendix 10.

Table 8: Nokia Sports Tracker: Main problems found using PROFCOM heuristics

Heuristic	**Prominent problem**
Facilitate self-presentation and creativity in the service.	Profile information that can be input is very limited.
Let the users define the limits of their privacy.	The group comments are public.
Create a sense of social presence.	A user's profile does not give a proper image of what the person is like.
Facilitate easy participation and content creation.	There is no section for newcomers to ask for advice.
Support users' networking.	The service does not include any kind of forum for informal discussion or private messaging.
Offer the content in a motivating way.	There is no prepared content that users could react to (apart from workouts).

4.1.3. Polar Personal Trainer

Even public profiles in Polar Personal Trainer include little information and do not give other users a clear view of what the person is like [Malinen 1, Preece 7]. The user can include links to other web services that may give more information but only one informal input field is available without any hints about what kind of information others might be interested in [Nielsen 3]. In addition, user profiles can be difficult to find due to the very limited search options [Malinen 3].

The service does not include a section for users to publish their own articles or training hints [Malinen 1]. Although the forum enables users to share information, it can be difficult for others to find it due to the number of discussion threads. The service does not therefore utilize the expertise of members of the community, many of whom might be able to help others in regard to their training [Malinen 1, Nielsen 1].

When starting to use Polar Personal Trainer, it may be difficult for users to become a part of the community [Malinen 3, Malinen 5]. The service does not include hints or guides for newcomers about what can be done or in what ways one can

communicate with other users [Malinen 4, Malinen 6]. Not even the adjacent forum has a section for new users where they could ask for advice from more experienced users.

A major sociability issue is that Polar Personal Trainer does not seem to give users a communal feel [Malinen 3]. Content created by other users is not displayed in the service, and the front page does not advertise the idea of taking part in a community [Malinen 8, Preece 1]. The service also does not include any aggregate information about users or their activities [Malinen 3]. The user therefore does not know how large the community is or how actively others use the service. Because of this, users may not even notice that it is possible to interact with others. Polar Forum includes some aggregate information but it does not seem an integral part of Polar Personal Trainer. Therefore, the forum's statistics may not apply to Polar Personal Trainer.

Apart from the temporary challenges, Polar Personal Trainer does not provide users with the possibility to form groups around a matter of interest [Malinen 5]. Members taking part in a challenge can communicate with each other through a dedicated page that also keeps track of progress toward the goal. However, after the challenge is completed, the related page is archived and the option to post messages is disabled. Although this can be circumvented by creating a challenge that reaches far into the future, challenges are clearly not designed for creating permanent groups that communicate actively.

Many problems related to sociability in Polar Personal Trainer are about finding information about other members of the community [Malinen 5]. Finding like-minded users is difficult because the user search requires that the user knows the other person's user name, real name or email address. This means that the users have had to form some sort of contact previously somewhere else [Preece 4].

The biggest problem in relation to content seems to be simply the lack of content created by users [Malinen 8]. Although the service includes a database of articles related to training and training programs created by professionals, articles can not be created, edited or even commented by users. The articles can be discussed in the separate forum but this is somewhat cumbersome. In addition, the articles seem static and do not contain any information about the authors which indicates that discussion will not lead to actual changes to the articles [Preece 8].

Polar Personal Trainer also includes many features that support sociability, such as the possibility to create user profiles that can be defined as public or private [Malinen 2, Preece 6]. This enables the user to reveal only the information he or she deems relevant to other users. Despite the shortcomings covered earlier, the adjacent forum can also be a good way to create discussion between community members.

Table 9 on the next page includes the PROFCOM heuristics used in the heuristic evaluation along with the most significant problem related to each heuristic. All results gathered during the heuristic evaluation of Polar Personal Trainer can be found compiled in Appendix 11.

Table 9: Polar Personal Trainer: Main problems found using PROFCOM heuristics

Heuristic	Prominent problem
Facilitate self-presentation and creativity in the service.	Profile information that can be input is very limited.
Create a sense of social presence.	User profiles do not give much information about what the user is like.
Facilitate easy participation and content creation.	The service does not include any hints or guides for newcomers.
Support users' networking.	Creating groups is not possible apart from the temporary challenges.
Offer the content in a motivating way.	Content created by users is not displayed in the service.

4.2. Background information about interviewees

As can be seen in Table 10 below, the interviewees trained in various forms of exercise. The most popular sport was overwhelmingly running, which featured in the training of 16 interviewees. Table 10 includes the sports that featured in the training of at least three interviewees.

Table 10: Sports interviewees engage in

Sport	Suunto Movescount	Nokia Sports Tracker	Polar Personal Trainer	Total
Running	8	6	2	16
Cycling	5	4	1	10
Gym training	4	3	2	9
Cross-country skiing	4	3	0	7
Swimming	4	0	1	4
Badminton	2	2	0	4
Martial arts	2	1	0	3
Group exercise	0	1	2	3

In addition to the service in question, some interviewees also used other methods or software related to fitness. Table 11 on the next page includes the different methods and software interviewees normally used in addition to their service of choice. The table features the methods used by two or more interviewees.

Interviewees were also asked about their use of other online communities. The majority of them used Facebook or YouTube and half of the interviewees stated that they visit discussion forums. Several interviewees also used Twitter. A more detailed

list of the interviewees' use of various online communities can be found below in Table 12.

Table 11: Fitness-related tools used by interviewees

Method / Software used to keep track of exercise	Suunto Movescount	Nokia Sports Tracker	Polar Personal Trainer	In total
Pen and paper	2	2	0	4
Microsoft Excel	1	2	0	3
Suunto Training Manager	3	0	0	3
Garmin Connect (web service)	1	1	0	2
Polar ProTrainer	0	2	0	2

Table 12: Online communities used by interviewees

Online community / type of service	Number of interviewees (out of 20)
Facebook	12
YouTube	11
Discussion forums	10
Twitter	5
LinkedIn	2
Blogs	2

4.3. Diary study

The ten test users of Suunto Movescount reported with varying enthusiasm about the testing period using the diary. All users filled in the form regarding the first time of use. The number of forms filled in during the following times of use varied from two to 10. Some users reported that they stopped filling in the diary when they no longer encountered new issues whilst using the service.

Opinions of the test users were divided about whether or not the service was tempting. As one user stated, the idea of sharing training data with others seemed "very tempting in theory" even though the service itself felt incomplete. Four of the test users expressed that they were very enthusiastic about using the service thanks to the pleasant front page and the features advertised on it. On the other hand, an equal number of users felt that the service's incomplete status and unsuitable front page meant that they did not feel tempted to use it. The main problem with the front page was, according to three test users, that it did not seem like the front page of an online community related to fitness. Instead, they described it as the front page of a commercial company's web site or a web site selling sports equipment. One test user also stated that to her, the front page made the service feel like it was related to fashion or music rather than fitness.

As a part of the diary study, test users were asked to describe what they felt the purpose of the service was. Unsurprisingly, all users mentioned the possibility of keeping a diary of one's own training. Three users also stated that the training diary could be used to help enhance training. Only one user stated that the service's purpose seemed to be creating an online community. This seems consistent with the test users' opinions about the previously mentioned problem of the front page giving a misleading impression. However, users did also include social features in their descriptions of the service's purpose. Sharing training information with other users was a feature mentioned by six test users. Half of them also stated that sharing this information would possibly help motivate not only the person submitting it but also his or her friends and other users of the service.

Many of the problems test users reported in their diaries during the testing period were related to features that were missing or unfinished at the time. However, a total of four users did report in their diaries that they also had problems connecting with other test users. One main problem was that they were unable to find information about the other users. This was due to the fact that during testing, user profile information could not be altered. Therefore a user's profile contained only an identification number used as the username and place of residence as sample information. A further problem reported by one user was that users were initially unable to see each other in the service.

As the testing of the service progressed, users started to find each other. In addition to profiles, users also found workouts created by other users. Those who were interested in the service as more than just a training diary became more motivated to use it and submit their own workouts. For some users, however, this burst of motivation was short-lived as they were unable to study the workouts in detail. One user also complained that she was unable to respond to a greeting she had received from another user.

Of the ten test users, four tried to create or join groups during the testing period. Only one of them reported any problems in creating a new group, and another user noted that including a picture in the group's information did not work. However, none of the users was able to join a group created by another user. This meant that users were unable to test group functions, which further prevented users from connecting with each other.

4.4. Interviews

The following subchapters include the main results gathered from interviews with users of the three services studied. The subchapters are grouped according to the main themes discussed in interviews.

Each opinion includes the information about how many interviewees mentioned it. Unless mentioned otherwise, the rest of the interviewees did not express any relevant opinions about the subject in question.

4.4.1. Social features in the services

When asked about expectations regarding the Suunto Movescount service, a total of six out of 10 interviewees mentioned that they expected the service to include social features in addition to a training diary. Two of them stated that they were expecting the service to include features that enable users to keep track of other users' training. The other four mentioned that they were expecting to take part in an online community, although they did not specify what this meant in their mind.

During the interviews, 12 interviewees of the 20 mentioned the possibility of sharing workouts as a prominent social feature in the services. In addition to sharing one's workouts, some interviewees mentioned that they are in turn interested in other users' workouts. Five interviewees brought forth the idea of keeping track of friends' workouts and how they have developed. Two of them also said that they would like to compare their own workouts to their friends' performance in order to increase motivation for exercising. Three of the seven Nokia Sports Tracker users also pointed out that, in addition to friends' workouts, the service also displays other users' workouts on the map. They felt that this makes it easy to find users and workouts in a certain area and gives the service a communal feel. The possibility of tracking another user's workout in real time was also mentioned by two users of Nokia Sports Tracker.

Unlike the other two services, Polar Personal Trainer has the possibility to send private messages to other users. However, only one interviewee of the three who used the service actually mentioned this possibility. The interviewee in question had even tested the feature, but did not use it regularly due to a lack of active friends in the service.

Although creating groups is promoted in Nokia Sports Tracker, only one of the seven interviewees using the service spontaneously brought them up when considering interaction with other users. A further two interviewees mentioned the possibility of commenting on other users' workouts, whilst the remaining four interviewees concentrated on features related to keeping track of their own training and routes.

Suunto Movescount also featured the possibility of commenting on other users' workouts, but interviewees were more interested in creating and taking part in groups and using them to communicate with others. A total of six interviewees of the ten mentioned the possibility of creating groups. Although the service itself only enabled users to create a group based on a certain sport, interviewees also mentioned other ways of creating groups, such as a group for people living in a certain area.

4.4.2. Finding information about other users

Most interviewees liked the idea of keeping an eye on friends' workouts using such a service. A total of 12 out of 20 interviewees, including five of the 10 users of Suunto Movescount, stated that they would like to use the service for this in addition to keeping track of their own training. Some of them wanted not only to see what friends were doing but also pick up useful fitness-related information. Four interviewees out of 20

were interested in the routes their friends had used during workouts for the purpose of trying out the routes for themselves. Three interviewees also wanted even more exact information about friends' workouts, such as length of workout and average heart rate in order to compare it to their own performance.

Four interviewees of the 10 who used Suunto Movescount stated that the possibility to follow a certain user's workouts is useful. They said that this feature could be used to motivate one's own training. In addition, users would also be able to encourage friends to exercise or compete against them.

Some interviewees were also interested in the workouts of unknown users. Three out of 20 mentioned that they are interested in who exercise in a specific area, typically near where they live or exercise themselves. They were particularly interested in the routes others use in their training and also how demanding the routes are.

When asked what kind of information they would like to find out about other users, three interviewees of the 20 simply stated that they are not that interested in other users' business apart from their workouts. The main reason for this was that the interviewees were only interested in people they know in the real world. On the other hand, one interviewee pointed out that friends' profile information can also be irrelevant since one is already familiar with it. Hence the profile information of acquaintances may be more important.

Half of all 20 interviewees did, however, list some items of profile information they would like to find out about the people behind the workouts. The most sought-after facts were age and where the user is from, both of which were mentioned by four interviewees. Three interviewees also mentioned that they would like to know what kind of exercise the user likes. Further interesting facts that some interviewees wanted to know about other users were their goals in regard to exercising, what kind of training they had performed along with related results, and how often they exercised.

Due to the unfinished state of Suunto Movescount during the testing period, the user profiles were not changeable. Therefore unsurprisingly, five interviewees of the 10 using the service noted that there was not enough information in the profiles. The other half of the test users either were not interested in other users' profiles or, in the case of three interviewees, had trouble finding them.

4.4.3. Sharing information to other users

Overall, interviewees wanted to share the same amount or less information about themselves that they wanted to know about others. Those who liked to share information wanted to share similar information about themselves as they wished to know about others. The most common characteristics to share with others using the profile were age and where the user is from, both of which were mentioned by four interviewees of the 20. In addition to the possibility of sharing all workouts publicly, three interviewees also wanted other users of the service to know how actively they train.

Some interviewees felt that there is some information they want to be hidden from other users in the service. Three test users of the 10 using Suunto Movescount mentioned that sharing especially regular routes publicly could enable someone to follow or otherwise harass the user. They therefore felt that users should be able to hide route information related to workouts. Two interviewees of the 20 interviewed also said that they would want to limit the visibility of photographs or videos possibly added to the service whilst another two stated that they would not have any objection to sharing photographs of themselves publicly. The latter two interviewees were both users of Facebook.

Another issue affected by the use of Facebook seemed to be whether or not interviewees wanted to show their real name in the service. Merely four users of the 20 stated that they use or would use their own name in the service instead of a username. These interviewees were all users of Facebook. However, despite being willing to share their names, they did not want to share as much information using the services in their current form as on Facebook. It should also be noted that a total of 12 interviewees out of 20 used Facebook which means that most of them did not necessarily want to use their own name when using the fitness-related web service.

The most common information interviewees wanted to share with their friends was their workouts. All but three interviewees of the 20 stated that they shared or would like to share workouts with their friends. Three interviewees also mentioned that they share information about their workouts to friends using Facebook. Going even further, four interviewees said that they do not or would not mind sharing all their workouts to all other users.

In stark contrast, many interviewees also stated that they aim to share as little information about themselves as possible. A total of eight interviewees out of 20 had this view, only one of whom was a test user of Suunto Movescount. The most common reason for keeping information private, given by seven of the interviewees, was that they wanted to use the service just to keep track of their own training. Despite this view, four of them also stated that they wanted to share workouts at least with friends and sometimes even publicly.

Five of the ten interviewees who used Nokia Sports Tracker or Polar Personal Trainer stated that they had included general comments related to the workout, for example feeling during the workout. Half of all 20 interviewees also liked to describe the workout session using route information or other detailed information about factors that may have affected performance. Some factors mentioned by individual interviewees were weather conditions, possible exercise carried out in addition to the main activity and in the case of gym exercise, specific movements performed during the session.

A total of 17 interviewees out of 20 told that they have access to a heart rate monitor that they can use during training. Three users of the ten using Nokia Sports Tracker or Polar Personal Trainer stated that they had such a device and consequently

had uploaded heart rate data. A further five of the 10 interviewees said that they had input heart rate data, such as average heart rate, manually in the workout details.

Although nine of the 10 interviewees who used Nokia Sports Tracker or Polar Personal Trainer had a heart rate monitor, not all of them used one regularly. In addition, the need for some of these interviewees to manually input data seemed to reduce their enthusiasm to log heart rate data. As a result, two of the 10 interviewees had resorted to using separate software to analyze their heart rate data.

For users of Nokia Sports Tracker, supporting GPS data was a central feature. Of the seven interviewees who used the service, six had a GPS device that enabled them to upload data to the service. The one user of Nokia Sports Tracker without a GPS device used the available map tools to draw and measure the routes she had travelled during her workouts. In the case of Polar Personal Trainer, only one of the three interviewees had access to a GPS device but even she had to input information about the length and duration of the workout manually.

Few interviewees felt a need for uploading multimedia content related to their workouts. Whilst this was not possible in Polar Personal Trainer that only supported one profile photograph per user, only four of the remaining 17 interviewees who used Suunto Movescount or Nokia Sports Tracker had included or wanted to include photographs in their workout information. Two of the seven users of Nokia Sports tracker also mentioned adding playlists of music listened to during the workout. Both of them, however, also pointed out that this was only because the playlists were uploaded automatically when transferring workouts from a compatible mobile phone to Nokia Sports Tracker.

4.4.4. Adding and browsing content

In the case of Nokia Sports Tracker and Polar Personal Trainer, half of the 10 interviewees felt that there was not enough motivation for adding content whilst the other half felt the opposite. However, of the five interviewees who did not want more motivation, two stated that this was because they simply did not feel a need for any external encouragement. Instead, they felt that their motivation stems from the exercise they do.

Users of Suunto Movescount seemed slightly less satisfied with the motivation the service offered. However, five of the 10 gave further explanations that were directly linked to the service being incomplete. They mainly complained about problems related to connecting with other users and technical issues that affected their motivation to add content or even use the service. Nevertheless, three Suunto Movescount users also stated that to them, the service already offered sufficient motivation regardless of incomplete or missing features.

Interviewees were also asked if they were interested in content added by other users. 14 out of 20 stated that they were interested in content added by other users, primarily their workouts. Four of this group did, however, limit their interest to their friends' workouts. Nevertheless, other content added by other users seemed to be

important for most interviewees. Only three of the 20 stated that they do not feel a need for new content added by others as they are only interested in their own workouts.

Users of Suunto Movescount and Polar Personal Trainer seemed unable to find features in the services that were clearly unnecessary. In the case of Nokia Sports Tracker, a total of four interviewees out of seven stated that the information about music listened to during the workout was unnecessary. However, they added that whilst they do not utilize the feature themselves, it does not really bother them. One of them even recalled that his friends had occasionally commented on the music he had listened to.

4.4.5. Enhancing training

Users from all three services mentioned various ways of using a fitness-related web service to enhance training. Especially some users of Nokia Sports Tracker and Polar Personal Trainer had clear views on how they could benefit their training by taking part in the community. The relatively short testing period of Suunto Movescount meant that its users were not perhaps able to perceive all the service's possibilities.

Four interviewees of the 20 stated that they like to compare their performance to the level of other users. For two of them, this even involved using routes other users used and competing against their results in order to estimate their own condition and progress. In addition to enhancing one's own training, two interviewees stated that they share their workouts or other content because they hope it will somehow be useful to others in their training. They felt that since they had studied other users' content to enhance their own training, they wanted to give something back to others in the community.

Five out of 20 interviewees stated that they would like such a service to include training programs that have been created by other users. Two of them were especially interested in training programs that had a specific target, such as running a marathon. The others simply wanted instructions for ongoing training with the aim of continuously improving or maintaining fitness.

An important aspect of studying other users' workouts in Nokia Sports Tracker and Suunto Movescount seemed to be the route information on offer. A total of eight interviewees of the 17 who used these two services were interested in finding new exercise routes in a specific area. Five of them were not only interested in routes near their homes but also in areas they were visiting during a trip or moving to. In addition to exercise routes, three of the 10 users of Suunto Movescount were interested in finding new types of exercise in order to diversify their training.

4.4.6. Taking part in group activities

For most of the users interviewed, exercise is primarily a solitary activity. A total of 14 interviewees out of 20 said that they mostly exercise alone. Two of them also mentioned occasionally training with a training partner or a group, along with the remaining six who mostly exercise with others. In addition to taking part in activities that require a

larger group of people, interviewees also used exercise as a way of keeping in touch with friends.

When asked about how they arrange possible group activities with friends, none of the 10 interviewees using Nokia Sports Tracker or Polar Personal Trainer stated utilizing online communities for this purpose. Instead, the methods, each used by two interviewees, were telephone, email or arranging activities when meeting face to face. One interviewee did, however, mention that he and his friends use the reservation system of a training facility to arrange workouts.

Nokia Sports Tracker has a feature for finding new training partners, but none of the seven interviewees had used it. On the other hand, one of the 10 users of Suunto Movescount clearly stated that he would like to find new training partners using the service. In addition, one user from each of the aforementioned services stated that this type of fitness-related web service should also include the possibility of organizing group activities. One of them contemplated this feature even further and suggested that if implemented properly, friends could join each others' workouts without having to make comprehensive arrangements beforehand.

In addition to arranging real-world group activities online, some test users of Suunto Movescount talked about further options related to forming groups. Two interviewees of the 10 noted that it is good to have the possibility to create both private and public groups. They explained that belonging to a larger public group lets users express which sports they are interested in or where they live. At the same time, according to the two interviewees, friends could create a smaller private group, in which they could share information they do not want outsiders to see. One interviewee felt that creating groups is unnecessary in some situations, and that there should be a possibility of simply linking friends to one's own profile instead of having to create a group.

4.4.7. Discussion about fitness

Although many users of Nokia Sports Tracker and Polar Personal Trainer concentrated on keeping track of their own training, some also wanted to discuss fitness with other users. The most popular way of communicating with others was commenting on friends' workouts. According to the interviewees, commenting on friends' workouts was mostly light-hearted discussion offering encouragement. Two users of the 10 using these services stated that they regularly comment on friends' workouts. Altogether, four interviewees of the 10 had commented on their friends' workouts. Although this is a minority, the other six interviewees noted that they did not have friends in the service to communicate with. None of the 10 interviewees had commented on workouts added by unknown users.

A mere five interviewees of the 20 interviewed stated that they wanted to take part in discussion with others. The most popular subject, mentioned by all five, was sharing or receiving tips regarding training. This included, for example, asking experts for advice or suggesting a training program to another user based on his or her previous training. Another popular subject, mentioned by four interviewees, was discussion about

new routes and places for training. Further interesting subjects of discussion for the interviewees were equipment and general training experiences that could help improve training. One interviewee was also interested in discussing how fitness-related strain injuries can be prevented or treated. As the subjects listed above show, the interviewees interested in discussion with others clearly wanted to focus on fitness-related issues following the theme of the services.

Five of the 20 interviewees said that they do not want any kind of feedback related to, for example, their workouts from unknown users. However, three of these five interviewees said that the main reason for not wanting feedback is that they feel it would not be helpful. They were not worried about anti-social behaviour but rather felt that feedback from unknown people would not have an impact on their training or using the service. One interviewee did, however, note that feedback from friends is an exception.

When asked what kind of feedback they would like to receive from other users, a total of five interviewees of the 20 stated that they would like to receive some sort of encouragement and support in relation to their training. One of them likened it to the kind of support and sociability one gets when taking part in a guided exercise group in the real world.

In addition to comments, users of Nokia Sports Tracker have the possibility of giving a positive or negative rating to a workout. However, only one interviewee out of seven mentioned this possibility and even he felt that the feature was slightly dubious. He felt that the possibility of giving negative ratings was pointless and suggested incorporating a more positive and encouraging rating system for workouts.

Interviewees also considered various other types of feedback from other users. Two out of 20 simply wanted informal comments related to training in addition to encouragement. Another two hoped to get tips about training methods. These tips would, however, involve more interaction than simple feedback, as the interviewees suggested the possibility of publishing workouts and other information and asking other users to comment on workouts or the training the user has planned. The other users would then be able to give instructions and discuss how the training results could be improved. A further two interviewees out of the seven who used Nokia Sports Tracker hoped that other users training in the same area would send suggestions about new routes that the interviewees themselves perhaps had not found.

4.4.8. Views on sociability

Interviewees had various views on sociability and how it should be implemented. For example, many users of Nokia Sports Tracker felt that the service had enough sociability simply because they did not see a need for it. On the other hand, two of the seven users of the service stated that it does not have enough sociability for their liking. One of them described activities on Nokia Sports Tracker as sharing information without actual interaction between users. Nevertheless, he also pointed out that this may be an intentional strategy if the service's main purpose is to be a training diary.

Even though there were few possibilities for discussion during Suunto Movescount's testing period, three users of the 10 felt that communicating with other users is an important part of using such a service. Two of them stated that in addition to fitness-related discussion, they would also like to talk to other users about other subjects. One interviewee even said that if the service could be used to stay in contact with friends, he might use it to replace Facebook. On the other hand, another interviewee stated that such a service is only suitable for fitness-related matters and that he would not use it to interact with friends.

Some of the interviewees reflected on how sociability could be increased in the service in question. Although Nokia Sports Tracker and Polar Personal Trainer had been in public use for years, the interviewees who complained about the lack of feel of community in the services seemed to be optimistic. Three out of 10 interviewees using one of the two services simply stated that the feel of community will increase as more people join the service.

There is a clear difference in the attitude towards sociability between Suunto Movescount and the two other services. In the case of Nokia Sports Tracker and Polar Personal Trainer, a total of eight out of 10 interviewees stated that the services have enough sociability. The most common explanation, given by five of them, was that they are mainly using the service as a training diary rather than an online community. Only two of the 10 users of Suunto Movescount gave similar statements, and one of them also noted that he is curious about what other users are doing. Both of these interviewees only engaged in individual sports and the purpose of their exercise was simply to stay in shape. However, other interviewees with similar backgrounds felt that there was a need for more interaction between users of the service.

One argument of three interviewees who were against adding more social features was that according to them, there are more suitable services for creating online communities. They stated that this type of fitness-related service is not really a suitable forum for discussion and instead they would use a different service for that purpose. An alternative solution to the problem was offered by two other interviewees of the 20, who would have liked to see a deeper connection with Facebook. They even went as far as suggesting that the service of their choice should become a part of Facebook. According to them, this would enable access to more users and help them strengthen their relationships with Facebook friends through discussion and other activities related to fitness. In addition, two interviewees also stated that they would share more information about themselves if the service they were using functioned more like Facebook.

4.4.9. Problems related to sociability

Three of the 10 test users of Suunto Movescount complained that to them, the service does not feel like a community. Their initial gripe with the service was its front page. Two of the interviewees stated that it makes the service feel more like a web site advertising and selling Suunto's products. On the other hand, one interviewee noted that

the aggregate information on the front page shows that there are other users, which helps create some feel of community.

Interviewees who used Nokia Sports Tracker or Polar Personal Trainer were less interested in communicating with other users apart from friends. Nevertheless, two of Nokia Sports Tracker's seven users also complained that there is a lack of contact with other users. They stated that if there was more contact, they would possibly get acquainted with other users' workouts and possibly even the users themselves. Nokia Sports Tracker already has a feature for finding training partners and a possibility to create groups, but two interviewees also suggested adding a new feature for organizing group workouts with friends or a larger group of people. One of them envisioned that the service could help the user to see whether a certain group is suitable for him or her by displaying information about the group's previous workouts, such as length and speed.

Another issue with communality in Suunto Movescount was the uncertainty about how social features could or should be used. This confusion was reported by three interviewees, two of whom complained that they had problems making out the difference between the service's two main sections, marked "ME" and "US". On the other hand, one interviewee of the 10 specifically complimented this division saying it made the difference between one's own and other users' business clear.

For some of the test users of Suunto Movescount, communication with other users during the testing period proved to be the biggest problem. Three of the 10 interviewees had trouble finding other users at all, and an equal number complained that they were unable to submit comments to other users. To solve the first of the aforementioned problems, two interviewees suggested that the service should include a user search. In relation to the second problem, two interviewees also noted that comments could not be added to other users' workouts, which was a feature they would have wanted to try out.

Users of all three services were asked what kind of features they would like to see added to the service they were using. The most wanted missing feature was a forum that could be used for informal discussion related to fitness and possibly also unrelated subjects. Although more interviewees mentioned a lack of discussion, the idea of adding a forum was mentioned by two out of seven Nokia Sports Tracker and four out of 10 Suunto Movescount users. Whilst one Suunto Movescount user stated that a forum would expand the service's user base, another one went as far as saying that unless there was a possibility for discussion, he would not use such a service. In addition to a forum, he and another Suunto Movescount user longed for a chat feature. They felt that in some situations, a more immediate way of communicating would work even better than a forum.

Although most interviewees were careful about sharing personal information, only one of the 20 people interviewed mentioned an unpleasant experience. Nevertheless, this experience had led him to stop sharing his workouts publicly in Nokia Sports Tracker. The event had involved another user tracking him using the service and

turning up along the workout route. Although the 10 users of Suunto Movescount did not test the service long enough to encounter such problems, one of them did note that the service does not give any information about how public profiles and other information actually are. As an example, he contemplated whether the user profile information can be found using a separate search engine. In addition, three users of Suunto Movescount insisted that users must have the chance to keep some workouts completely private.

Some users of Nokia Sports Tracker and Polar Personal Trainer felt that the services should be more accessible to popular online communities. Although only three out of 10 interviewees mentioned this deficiency, they felt that this was a major problem. One of the main complaints with Polar Personal Trainer was that it did not have a feature for sharing links to workouts using, for example, Facebook or Twitter. On the other hand, Nokia Sports Tracker had this feature but there were still complaints that sharing workouts was too cumbersome and workout information or statistics could not be sent to Facebook.

4.5. User experience questionnaire

All results from the user experience questionnaire's numeral questions are compiled into Table 13 on the next page. The possible responses from interviewees ranged from "1", meaning "No", to "7", meaning "Yes". The results give some insight into how different aspects of sociability of the services have been achieved in the eyes of the interviewees. One clear distinction is that all averages related to Suunto Movescount are below the overall average. As mentioned earlier, this may be due to the incomplete state of the service. In addition, many of the test users of Suunto Movescount had very high expectations not only in regard to the service's functionality but also to sociability. A total of six of them stated in the questionnaire that they had expected to take part in an online community or social activities during testing.

The results of the questionnaire show that the biggest problems faced by users of Suunto Movescount were getting information about other users and taking part in the activities and discussions. The rest of the sociability aspects did not evoke strong positive or negative views.

As can be seen in Table 13, Nokia Sports Tracker's mainly received averages and modes of at least 4.0, which means that users had positive or indifferent feelings towards the various aspects of sociability. The only one of them to feature a mode below 4.0 was whether the service encouraged users to add content. According to the questionnaires' results, this is the only problematic area in the service in regard to sociability.

Polar Personal Trainer received quite similar results in the questionnaire as Nokia Sports Tracker. As can be seen in Table 13, all averages of the interviewees' responses were 4.0 or higher, which indicates that all aspects of sociability were considered neutral or positive by the interviewees. Although opinions were on the

positive side, averages only ranged from 4.0 to 5.3. It should be noted that only three of all the interviewees were users of Polar Personal Trainer. In some cases, this resulted in neutral averages due to stronger opinions being cancelled out by each other.

Table 13: Comparison of the services' sociability aspects

		Suunto Movescount	**Nokia Sports Tracker**	**Polar Personal Trainer**	**All**
	Number of users	10	7	3	20
Were you able to express yourself the way you wanted?	Average	3.7	6.0	5.0	4.7
	Standard deviation	1.1	1.2	1.0	1.5
	Mode	3.0	7.0	-	5.0
Have you received enough information about other users?	Average	2.1	6.0	4.7	3.9
	Standard deviation	1.6	1.2	2.5	2.4
	Mode	1.0	7.0	-	1.0
Have you been able to take part in the service's activities and discussions?	Average	2.3	4.1	5.0	3.4
	Standard deviation	1.4	2.3	1.0	2.0
	Mode	1.0	6.0	-	1.0
Have you been able to do what you have wanted in the service?	Average	3.5	4.0	5.3	4.0
	Standard deviation	1.5	1.8	0.6	1.6
	Mode	4.0	5.0	5.0	5.0
Does the service encourage being active and producing content?	Average	3.6	4.6	4.0	4.0
	Standard deviation	1.6	1.7	2.0	1.7
	Mode	4.0	3.0	-	4.0
Does the service have enough new and interesting content?	Average	3.9	4.7	4.7	4.3
	Standard deviation	1.4	2.1	2.1	1.7
	Mode	4.0	6.0	-	4.0
		Scale: No 1 – 2 – 3 – 4 – 5 – 6 – 7 Yes			

4.6. Comparison of results

Most of the significant sociability problems noted by interviewees had also been discovered during heuristic evaluation. The results of the evaluation results featured a

far greater number of problems and positive features than interviewees brought forth. This is not, however, surprising as the heuristic evaluation focused on sociability issues whilst interviewees examined different aspects of the service according to their interests.

The main observations when comparing results from the questionnaires and heuristic evaluation are described in Chapter 4.6.1. More detailed analysis and comparisons between the results of heuristic evaluation and interviews can be found in Chapters 4.6.2 - 4.6.7.

4.6.1. Validation of sociability heuristics

The main sociability problems of Suunto Movescount noted during heuristic evaluation were shortcomings in finding other users and information about them, communicating with other users and the lack of prepared content and rewards for content added by users. As we can see, the first two sociability issues noted were also clearly voiced by the interviewees. As mentioned in Chapter 4.5, the biggest problems faced by users of Suunto Movescount were getting information about other users and taking part in the service's activities and discussions.

As can also be seen in Chapter 4.5, the only below-average grade of Nokia Sports Tracker was whether the service encouraged users to add content. According to the questionnaires' results, this is potentially a problematic area in the service in regard to sociability. The heuristic evaluation included several sociability issues that were deemed more severe but the issue of the service not encouraging adding content was also noted during the evaluation.

Judging from the results of the questionnaire, Nokia Sports Tracker's users were happy with the service's sociability aspects. Interviewees were especially satisfied with being able to express themselves and receive information about other users, even though they reported some problems related to both aspects. However, most of the interviewees were not that interested in other users. This may explain why the results differed from those of the heuristic evaluation. During the evaluation, several moderately severe problems were related to the users not being able to express themselves or finding information about others. Especially the insufficient profile data, noted during evaluation, is closely related to both aspects.

The heuristic evaluation of Polar Personal Trainer included far more problems and positive features than were mentioned by interviewees. As in the case of Nokia Sports Tracker, these differences were related to how the service was viewed. The evaluation's focus was on sociability issues whilst interviewees focused on other aspects more important to them. Interviewees therefore did not bring forth as many sociability issues as the evaluation since they were more interested in the exercise aspect of the service than the community aspect. Nevertheless, users of Polar Personal Trainer did also cover sociability issues during interviews even though they seemed quite happy with the service's current state. These issues are covered in more detail for Polar Personal Trainer and the two other services in Chapters 4.6.2 - 4.6.7.

4.6.2. Expressing oneself

The heuristics that have been linked to expressing oneself in the service are listed below in Table 14. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 14: Expressing oneself: heuristics

Identifier	Heuristic
Malinen 1	Facilitate self-presentation and creativity in the service
Preece 7	Self-expression

Overall, the 10 users of Nokia Sports Tracker and Polar Personal Trainer seemed to have a good idea of what could be done in their service of choice. They therefore felt that whether they chose to express themselves or share information was dependant more on their own actions than the service's limitations. In the case of the incomplete Suunto Movescount, the limitations in regard to expressing oneself were more apparent.

Suunto Movescount

During heuristic evaluation, Suunto Movescount was criticized for not giving users a proper possibility to bring forth their expertise or content. The 10 interviewees did not directly express such shortcomings, but they did feel that sharing information was an important part of using the service. Six of them felt that sharing workouts is a main feature of the service. Users of Suunto Movescount were also more eager to share information about themselves than the users of the two other services. They therefore also noted more positive features related to sharing, such as including a photo in the personal profile. This possibility was also documented during heuristic evaluation. Another important aspect of sharing information brought forth by users was the need to keep some information private instead of publishing everything. Although privacy settings did not work during testing, users were eager to consider situations that would demand limiting the visibility of information. The service's privacy settings were also documented as a positive feature during heuristic evaluation despite their nonoperational state.

The heuristic evaluation of Suunto Movescount also brought up the lack of a forum for informal discussion. The lack of possibilities to communicate with other users seemed to be an issue for the interviewed users as well. Many of them wanted more communication, although only one of them specifically brought up the idea of adding a discussion forum. Nevertheless, the lack of discussion was a problem clearly noted during both interviews and heuristic evaluation.

Nokia Sports Tracker

The seven users of Nokia Sports Tracker were happy with the service's current possibilities for sharing personal information. Instead, information related to workouts seemed to be more important to users than sharing information that helps to get to know them. This may explain why the results differ from the ones gathered using heuristic evaluation.

During heuristic evaluation, Nokia Sports Tracker was criticized for shortcomings related to users being able to introduce their views and matters of interest. This critique centred on the user profiles that included relatively little information, which means that users may have problems finding new contacts. However, during interviews, users of the service did not complain about this even though all of them liked the idea of having friends in the service.

Interviewees also found some positive features that were missed during heuristic evaluation. For example, in the case of Nokia Sports Tracker, the ability to add photos taken during workouts was mentioned by three interviewees. Another feature missed during heuristic evaluation was the possibility of sharing one's workout in real time.

Polar Personal Trainer

As in the case of Nokia Sports Tracker, the three users of Polar Personal Trainer also gave positive answers when asked if the service enabled them to express themselves the way they wanted. During the interviews, all users of Polar Personal Trainer stated that they did not want to share additional personal or workout information in the service's current form. However, two of them did note that if the service was more like Facebook, they would like to share more. This supports the notion that users have few possibilities to share their matters of interest, which was also documented during heuristic evaluation.

Even though Polar Personal Trainer includes a forum, it did not seem to encourage users to express themselves. Only one of the three interviewees had used the forum and even he stated that he did not use it regularly. A forum therefore did not seem to be that important to users of the service even though one was available. Nevertheless, the heuristic evaluation did correctly help observe that the included forum could be useful but perhaps lacked features for encouraging discussion, such as a section for new-comers to ask questions from more experienced users.

4.6.3. Getting information about other users

The heuristics that have been linked to getting information about others using the service are listed in Table 15 on the next page. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 15: Getting information about other users: heuristics

Identifier	Heuristic
Malinen 3	Create a sense of social presence
Preece 4	Supporting both deep and light discussions (or content-creation)

During heuristic evaluation, it was noted that user profiles in all three services include little information and therefore do not give much indication of what the person is like. Interviewees also agreed with this notion and felt that profiles should include more information, such as where the user is from and more detailed descriptions about his or her training. For example, five of the ten interviewees who used Suunto Movescount stated that the users' profiles did not include enough information.

Suunto Movescount

Three users of the 10 who used Suunto Movescount complained that during the testing period, they had problems finding other users. Two specifically criticized the lack of a user search. Similar results were mentioned in the heuristic evaluation that stated that the possibilities for searching and filtering users were insufficient.

A very popular aspect of using Suunto Movescount seemed to be the possibility to follow other users' workouts. Half of the users wanted to keep an eye on their friends' workouts to, for example, increase motivation for exercising. This feature was also noted during heuristic evaluation as a solution supporting sociability.

Nokia Sports Tracker and Polar Personal Trainer

The 10 users of Nokia Sports Tracker and Polar Personal Trainer were not that interested in other users' personal information. Some of them stated that they were only interested in their own training and others felt that other users' workout information sufficed. As a result, interviewees had little information about other users apart from friends who happened to use it. Two interviewees did, however, complain that there is a lack of contact with other users in the service. This complies with the results of the heuristic evaluation that state that the service does not provide any information about the number of users or who they are.

Another serious deficiency noted during heuristic evaluation was that finding like-minded users or training buddies is very difficult using the current search functions in Nokia Sports Tracker and Polar Personal Trainer. Rather surprisingly, however, this did not seem to be a problem for interviewees. None of them complained about the user search features. On the other hand, interviewees seemed uninterested in finding new contacts and none of them mentioned having used the search feature. The users who had friends in the services, had initially come into contact with them elsewhere. Nevertheless, three interviewees did mention that it is easy to find other users who exercise in a specific area using Nokia Sports Tracker's map, even though they were mainly interested in the workouts and routes.

Although most of the 10 interviewees were not perhaps interested in other individual users, two of them stated that they would like to have a feature for organizing group workouts, ignoring the possibility of searching for training buddies altogether. This implies that users may not want to find specific users or, as the heuristic evaluation concluded, the search features are insufficient.

4.6.4. Becoming a part of the community

The heuristics that have been linked to becoming a part of the community are listed below in Table 16. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 16: Becoming a part of the community: heuristics

Identifier	Heuristic
Malinen 5	Support users' networking

During heuristic evaluation, all three services were noted to include possibilities for forming and joining groups in order to take part in community discussion and other activities. Nevertheless, both the heuristics evaluations and interviews brought up problems in all three services that limit the users' possibilities to become a part of the community.

Suunto Movescount

Suunto Movescount received some criticism during the heuristic evaluation for its lack of a discussion forum. However, users of Suunto Movescount were quite interested in including a forum. Four of the 10 interviewees specifically stated that Suunto Movescount should feature a forum for discussion. Two interviewees were also interested in a chat feature.

The heuristic evaluation also brought up the problem that Suunto Movescount does not feature any discussion or other possibilities for new-comers to ask other users for advice. In relation to this, five interviewees also mentioned that they wanted to receive instructions related to training, such as training programs, from other users. However, none of the users mentioned wanting guidance from other users in using the service itself.

During heuristic evaluation, Suunto Movescount was also criticized for the lack of private messaging or other ways of deepening communication. Two interviewees did, however, note that the service does include at least one such feature. The possibility to follow other users was in their opinion a useful feature. To them, this feature seemed like a good way to deepen communication even though it was somewhat lacking during the testing period.

One of the main features supporting sociability in Suunto Movescount, documented during heuristic evaluation, was the possibility to create a group around a

matter of interest, typically a certain sport. Interviewees also clearly felt that groups were one of the most important aspects of the service. Six of them stated that they had an interest in creating or taking part in groups. Two of them also generalised that like Suunto Movescount, such a service should include the possibility to create both private and public groups. This notion was missed during heuristic evaluation even though both group creation and privacy issues are covered in the heuristics.

Nokia Sports Tracker

During heuristic evaluation, one of the features noted for supporting sociability in Nokia Sports Tracker was the possibility of forming a group around a subject of interest. Although most interviewees mentioned this possibility, attitudes were similar as they were in the case of generally being a part of the community. Only one interviewee out of the seven interviewed was clearly interested in creating groups and sharing experiences with their help and had done so. Others were not that interested depending mainly on whether they had friends in the service.

For interviewees, a more important sociability issue related to Nokia Sports Tracker was the lack of discussion. For example, two of them stated that they would like the service to include a forum for discussing training and other subjects. This shortcoming was also brought up during heuristic evaluation as one of the main problems of the service in relation to sociability. Discussion was, however, yet again a matter that was subject to opposing views from interviewees. Three interviewees distinctly stated that they did not want the service to include any more discussion.

Polar Personal Trainer

One major difference in Polar Personal Trainer when compared to the two other services in terms of sociability was the included discussion forum that was acknowledged during heuristic evaluation. However, depending on their interest to communicate with other users, the importance of the forum to the three interviewees varied.

Of the three interviewees who used Polar Personal Trainer, two had noticed the forum and only one of them had posted some messages on it. This does, however, indicate that some users want to use the forum and therefore it can be, as the heuristic evaluation implied, in a notable role in the service when considering social interaction between users.

4.6.5. Being able to do what one wants

The heuristics that have been linked to being able to do what one wants in the service are listed in Table 17 on the next page. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 17: Being able to do what one wants: heuristics

Identifier	Heuristic
Malinen 2	Let the users define the limits of their privacy
Malinen 6	Support different user roles
Preece 4	Supporting both deep and light discussions (or content-creation)

Apart from the lack of a forum in Suunto Movescount and Nokia Sports Tracker, according to the heuristic evaluations, the three services did not include any severe sociability problems related to being able to do what one wants. Interviewees also did not report such problems. Instead, they mainly focused on more technical issues.

Suunto Movescount

The main issues related to being able to do what one wants noted during the heuristic evaluation of Suunto Movescount were the lack of possibilities to discuss matters of interest using a forum. During interviews, users particularly brought forth the lack of discussion in the service. However, the 10 interviewees did not bring forth problems with sharing one's own knowledge with other users. Instead they focused merely on the general lack of communication between users during the testing period. The lack of discussion was nevertheless also noted during heuristic evaluation as one of the major sociability issues in Suunto Movescount.

Most of the problems mentioned by the interviewees concerning not being able to do what one wants in Suunto Movescount can be linked to the incomplete state of the service. Complaints addressed technical problems or features missing from the service at the time of testing. Towards the end of the testing period, users got more familiar with the service and started to better realize the possibilities of the service. As a result, some of them started to long for more versatile features related to interaction with other users.

Nokia Sports Tracker and Polar Personal Trainer

During interviews, a total of three of the seven users of Nokia Sports Tracker mentioned having shared workouts using Facebook. One out of three Polar Personal Trainer users also complained that the service does not provide any methods for including workout data or statistics in another service such as Facebook. As the heuristic evaluations in this study only covered the three fitness-related web services, the possibility of co-operation between two online communities was not considered during evaluation. Nevertheless, this type of connection was seen by some interviewees as a viable option for bringing more users to both services and also opening up new possibilities for sociability.

The results of the heuristic evaluation of Nokia Sports Tracker included criticism about the lack of a possibility to send private messages to other users. Other problems found in Nokia Sports Tracker during heuristic evaluation were the lack of personalization options and the fact that comments on a group's page were always

public. However, none of these problems was mentioned by users during interviews, which implies that these issues may not be significant to them. Also, interviewees perhaps simply had not felt a need to use the features in question and subsequently had not encountered the related problems.

A feature supporting sociability in Nokia Sports Tracker, noted during heuristic evaluation, was the possibility of giving other users' workouts votes and commenting on them. Interviewees also mentioned this possibility although most of them did not regularly comment on workouts. Two of them did, however, state that they often commented on friends' workouts and friends reciprocally on theirs. The importance of this feature clearly depended on whether the user had friends in the service. Interviewees who had friends in the service saw commenting as a more important feature than those who communicated with friends using other means.

4.6.6. Encouraging being active and creating content

The heuristics that have been linked to encouraging users to be active and create content are listed below in Table 18. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 18: Encouraging being active and creating content: heuristics

Identifier	Heuristic
Malinen 4	Facilitate easy participation and content creation
Malinen 7	Reward active users and give recognition
Nielsen 1	Make it easier to contribute
Nielsen 4	Reward - but do not over-reward - participants
Nielsen 5	Promote quality contributors

All three services rely heavily on users when it comes to creating content. However, all of them had some issues in encouraging users to submit their content, noted both during heuristics evaluation and interviews.

Suunto Movescount

As mentioned in Chapter 4.6.3 and noted during heuristic evaluation, users of Suunto Movescount have few possibilities to find information about other users. This may diminish the users' motivation to submit new content. This notion is supported by three of the 10 interviewees, who stated that their motivation to submit their own content decreased due to the lack of contact with other users and their workouts.

As noted during heuristic evaluation, Suunto Movescount did not provide any rewards based on quality or quantity of contributions. For interviewees, this did not seem to be an obvious shortcoming as none of them mentioned needing any kind of reward for adding content. However, the apparent need for some interviewees to share their own and study other users' workouts implies that other users' interested in the

content may provide enough motivation. Nevertheless, it should also be noted that not all interviewees were interested in sharing their workouts or viewing workouts added by others. The service did not provide any apparent motivation for these interviewees if simply logging their own training data was not enough.

Nokia Sports Tracker and Polar Personal Trainer

There seemed to be differing views among the 10 users of Nokia Sports Tracker and Polar Personal Trainer in regard to whether the services encouraged them to be active. On one hand, some users commended the service they used because adding new workouts was very easy. On the other hand, some felt that the service itself did not actively encourage adding content. They felt that as a result, the activity of the users was mainly up to themselves. Similar results were reached during the heuristic evaluation for both services. The heuristic evaluation indicated that neither service was successful in encouraging users to be active.

The heuristic evaluation concluded that there are no incentives for participating or adding workouts to Nokia Sports Tracker apart from seeing an increase in one's personal workout statistics. In the case of Polar Personal Trainer, a major redeeming feature was the possibility to take part in challenges with other users. However, none of the three interviewees who used Polar Personal Trainer actively took part in challenges and only one of them even mentioned them during interviews. As far as the interviewees using either service were concerned, they did not crave external incentives for exercise or using the service since their main motivation came from training and staying in shape.

4.6.7. New and interesting content

The heuristics that have been linked to new and interesting content in the service are listed below in Table 19. More detailed explanations for the heuristics can be found in Appendices 1-3 with the help of the identifiers included in the table.

Table 19: New and interesting content: heuristics

Identifier	Heuristic
Malinen 8	Offer the content in a motivating way
Preece 8	Reliable and up-to-date content/information

As noted during heuristic evaluation, Polar Personal Trainer was the only one of the three services that featured content added by administrators. In the two other services, adding new and interesting content was entirely up to the users. However, this did not seem to be a major problem for the interviewees as most of them were mainly interested in content added by other users.

Suunto Movescount

Suunto Movescount featured very little content, which was noted during heuristic evaluation. Many of the interviewees also had similar complaints. Nevertheless, two of the 10 interviewees also noted that the available content felt interesting. A further three interviewees were quick to point out that the lack of content was perhaps due to the incomplete state of the service and that it had great potential to feature more interesting content in the future. Perhaps as a result of these types of opinions, most of the interviewees gave neutral statements about content during the testing period.

During heuristic evaluation, it was also noted that apart from the users' workouts, the Suunto Movescount's content was not updated. Some of the interviewees were also interested in knowing better how the service would be developed in the future. Interviewees even brought forth suggestions for feasible new features.

Nokia Sports Tracker and Polar Personal Trainer

During heuristic evaluation, the main complaint about content in Nokia Sports Tracker was that there was no prepared content users could react to, such as news related to fitness or upcoming events. The seven interviewees, on the other hand, did not express any specific type of content they would have liked added to the service. For most, the current content was sufficient and others were mainly interested in finding more workouts instead of new types of content.

Unlike Nokia Sports Tracker, Polar Personal Trainer included articles and instructions related to fitness. This was potentially a significant asset of the service that was noted during heuristic evaluation. The three interviewees, however, did not seem that interested in the articles. Only one of them mentioned reading them. He also noted that there should be even more guidance for gym exercises.

5. CONCLUSIONS

The study was based on three main research questions. The first and perhaps most important question was whether sociability heuristics can be used to evaluate sociability in online communities. In practise this meant validating the heuristics using interview data from users.

The second question was what kinds of social features users want a fitness-related web service to include. This also included the question whether users wanted such a service to include social features at all.

Finally, the study aimed to investigate what sort of role sociability plays in the overall user experience in such a web service. This gave further insight into how important social interaction and evaluating sociability are in this type of service.

5.1. Validating sociability heuristics

Overall, heuristic evaluations of the services studied produced results similar to the interviews conducted with users. Although the results are nowhere near identical, most of the serious problems related to sociability were discovered using both methods. This indicates that heuristic evaluation using sociability heuristics can clearly be helpful in situations in which user testing and interviews are difficult to carry out.

Although heuristic evaluation produced results consistent with interviews in some areas, the sociability heuristics used clearly should not be considered as a complete replacement to user testing or interviews. The main contrast between results of heuristic evaluation and interviews seems to be whether problems found during the evaluation were actual problems for the users. The heuristic evaluation produces a significantly longer list of problems than the interviews which supports the notion of false positives. In turn, some moderate or minor problems are only discovered during interviews.

Naturally, it would be unrealistic to expect the two methods to produce identical results. Most of the results were parallel and, apart from the problems discovered during heuristic evaluation that actually were not problems for interviewees, there were no significant contradictions. These false positives do, however, indicate that results gathered from heuristic evaluation may lead to unnecessary or possibly even harmful development decisions if used as the only point of reference. Therefore, interviews or other methods should also be used to verify results from the heuristic evaluation before making major changes to the service.

5.2. Desired social features

Sharing workouts is clearly a feature that users like to see in a fitness-related web service. Even users who do not share their own workouts are interested in what others are doing which is a clear indication that there is a need for connecting with other people at some level, even if this does not mean finding new friends. In fact, users seem uninterested in finding new contacts in such a service but keeping contact with old friends is important. Commenting on content added by friends is clearly a desired feature and can in some cases be the preferred way of communicating. Nevertheless, users also want the possibility for general discussion, in practise a forum. As this indicates, even the same user can want various different options for communicating with others. The preferred method is, however, clearly linked to how well the user knows the other party. For discussion with unknown people users prefer a forum whilst communication with friends is preferably carried out using private messages or comments on workouts shared among a group of friends.

In addition to simply discussing fitness with others, users are also interested in taking part in groups. Users seem especially interested in recreating groups that exist in the real world and using the service to communicate with other members of the group. Although this viewpoint appears somewhat limited, creating such a group lures users to use the service and they can subsequently start finding new contacts outside the group.

According to the interviews, a serious shortcoming of all the services studied seems to be very limited profiles. Without sufficient profile information, it can be difficult for users to find new contacts in the service. Although users seemed in general uninterested in finding new friends in such a service, the lack of other users' profile information dampens the interest even further. Users felt that they would like to know more about the people behind the workouts than is currently possible.

Finally, it should be noted that the lack of enthusiasm for social features seen in some users was not that surprising. The heuristic evaluation already indicated that the services had some major deficiencies in regard to being online communities. In practise, however, these apparent deficiencies meant that the service was well suited for people who simply wanted to maintain a training diary. As use of the social features was optional, these people felt that the service functioned well even without utilizing them.

5.3. The role of sociability in user experience

The importance of social features and sociability seems to depend significantly on what the user is using the service for. There were three distinct uses for such fitness-related services: training diary, keeping an eye on friends' workouts and discussing fitness-related issues with other, possibly previously unknown, users. Users who were mainly interested in maintaining training diaries did not see sociability as an essential part of using the web service. The two other types, however, were not only interested in social interaction, but in some cases even felt that it was the main reason for using the service.

Based on the comparison between the users of Suunto Movescount and the longer-term users of Nokia Sports Tracker and Polar Personal Trainer, the need for sociability in a fitness-related web service seems to diminish over time if social features are lacking or users do not have friends in the service. New users of a fitness-related service are clearly more interested in social features than older users of Nokia Sports Tracker and Polar Personal Trainer who, for various reasons, have lost motivation to utilize such features. Alternatively, the same reasons may have led to users interested in social features simply moving to other, more suitable web services. In addition, many of the long-term users of Nokia Sports Tracker and Polar Personal Trainer use another online community for keeping in touch with friends and acquaintances and even discussing issues related to fitness.

As a result, the effect of sociability in a fitness-related web service on the overall user experience seems relatively small at first glance. However, this is clearly due to the fact that users utilize alternative web services for their sociability needs. The role of sociability is further emphasized by the fact that instead of longing for more social features to be added to the fitness-related service, some users would like to see it integrated into another online community they regularly use for interaction with other people. The interest in sociability features therefore clearly remains even if the fitness-related service does not provide users with sufficient social features. Users simply concentrate their social interaction into the online community that has the needed features and, perhaps most importantly, is also used by their friends and acquaintances.

5.4. Heuristics lists used

Although the three heuristics lists utilized in this study were used together to gather information about sociability, some comparison between them is useful. It should, however, first of all be noted that none of the heuristics lists was superfluous. The same results for heuristic evaluation could not have been reached using only one or two of the lists even though all lists were not equally represented in the results.

Of the three lists used, the PROFCOM heuristics produced the biggest number of results. This was partly due to the fact that in some areas, there was overlap between the lists, and in such cases, the PROFCOM heuristics were used. Nielsen's participation guidelines and Preece's sociability heuristics had somewhat different viewpoints on sociability and therefore did not overlap each other. This meant that these two lists were good choices to complement the PROFCOM heuristics.

The overlap between the PROFCOM heuristics and the two other lists indicates that the PROFCOM heuristics are the most viable solution if only one of the lists is chosen. Nearly all serious sociability issues were found using the PROFCOM heuristics, and they also covered a great range of sociability issues. These factors indicate that whilst the PROFCOM heuristics were not completely validated in this study, they are currently the best choice for gathering information about sociability by means of heuristic evaluation.

5.5. Research limitations

Due to the incomplete state of the Suunto Movescount service, some features were incomplete or nonoperational. As a result, users faced some significant technical and sociability issues that perhaps prevented them from getting a complete picture of the service. This may in part explain differences between the results from heuristic evaluation in comparison to interviews, namely the fact that the heuristic evaluation produced a significantly greater number of problems related to sociability.

Another important consideration is that users of Nokia Sports Tracker and Polar Personal Trainer had voluntarily chosen the service they used. Therefore, they were presumably using the service that was most suited to their needs. Users of Suunto Movescount, on the other hand, had never seen or used the service before the testing period began. They were therefore unfamiliar with the service and the majority of the testing period involved users getting to know it. This meant that users clearly started to notice sociability issues more toward the end of the testing period. A longer period of use might have resulted in more observations about sociability. On the other hand, users themselves felt that they had got a complete picture of what the service was like in the time available.

All users of Nokia Sports Tracker and Polar Personal Trainer interviewed had used the service for more than six months. This meant that there was a potential for major differences between their answers and those given by users of Suunto Movescount. In some cases, there was indeed a clear difference between users of the different services. Users of the new Suunto Movescount service were clearly more interested in social features than users of the two other services. As a result, some issues featured two different outlooks. One was the view of new users of a service, Suunto Movescount, and the other the view of long-term users of a service, either Nokia Sports Tracker or Polar Personal Trainer.

5.6. Generalisation

It should be noted that whilst the web services studied are treated as online communities, this is not their primary purpose. Therefore, the results of this thesis related to social features should not be applied directly to online communities in which social features are in a central role. However, the results regarding the validation of sociability heuristics indicate that these heuristics produce acceptable results about a web service's sociability aspects. Whilst further studies are needed, the heuristics seem to provide an effective method for finding problems related to sociability. The results should, however, be verified using traditional user testing if possible.

The results in regard to social features are in a close relation to the context of a training diary. Therefore, some of the results are only relevant to fitness-related web services. On the other hand, as the web services studied are mainly for recreational use,

some results can also be generalised for various types of recreational online communities.

5.7. Proposed future research

As the Suunto Movescount service was incomplete during testing, the possible changes made based on the results of this thesis should be evaluated. A similar, but perhaps smaller, study would help to determine whether changes made based on the heuristic evaluation or interviews have solved sociability issues in practise. It would also help to confirm that the heuristics produce tangible improvements in sociability.

As mentioned previously, using interviews as a method for validating sociability heuristics seems to work relatively well. However, results are not always consistent, as some problems found using sociability heuristics are not considered problems by users of the service. Therefore, alternative, and potentially more accurate ways for validation should be investigated. It is highly unlikely that any single method produces the same results as heuristic evaluation thus validating the heuristics, but some improvement is needed over using just interviews and questionnaires. Therefore, instead of switching to another method, it should perhaps be used alongside interviews and questionnaires to cover areas that these methods missed. The results of this study show that using the sociability heuristics is very easy and they produce plenty of results but complete validation of the heuristics still requires more research and different approaches.

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APPENDIX 1: PROFCOM SOCIABILITY HEURISTICS

#	Heuristic	Explanation
1	Facilitate self-presentation and creativity in the service	People have needs for self-presentation, identity construction, and sharing their interests with others. Users should be able to communicate with their own words, to create a personal style, and to differentiate themselves from others. In order to interact personally and in greater depth, each member should be recognized and identified. A personal style is also required for continuous social interaction.
2	Let the users define the limits of their privacy	Users should have a sense of control and autonomy regarding information about them. Sometimes the use of real names promotes trust and cooperation in an online context. Knowing each other is particularly important if the purpose of the community is to activate users in matters related to their neighborhood or hometown. Then again, in those communities where people may want to reveal more information the best practice is to build a virtual identity at first and then to reveal confidential details about their lives over time.
3	Create a sense of social presence	In an online environment, anonymity and invisibility are challenges for the building of trust. In order to create the sense of community among users, technology should create and strengthen the sense of social presence.
4	Facilitate easy participation and content creation	Users are interested in plentiful and up-to-date content. Participation in the community's activities should be easy for users, and especially posting to the community should be easy. For example, joining general discussions would be a good way to start participation for a newcomer and then the participation would not require any special skills or expertise. Fast and informal reaction should be possible, for example by commenting on and rating the content.

5	Support users' networking	Users should have the opportunity for social networking and becoming acquainted with others, for example with private messages that make possible a more personal level of communication. Private discussions may lead to the emergence of user-generated interest groups, an increased sense of community, and real-world meetings as well.
6	Support different user roles	The different roles of online community users should be supported in order to attract as many people as possible. Lurking, that is, just observing what others are doing, should also be possible because it is often a way in which newcomers get to know the community and its rules, and get into it.
7	Reward active users and give recognition	Loyal and active users can be rewarded by giving positive feedback in the community. The recognition from the administrator may reward and encourage users to put more effort into the quality of the content. However, rewarding with incentives or measurable credits can lead to a great number of contributions at the expense of quality.
8	Offer the content in a motivating way	Users are looking for new and updated content. Users should be offered personalized and filtered content, as well as personally relevant information by keeping them updated about recent activities in their groups and social networks. For example, with a news feed or notification alerts to a mailbox, as in Facebook, where the alerts invite the user to visit the community whenever something new has occurred.

APPENDIX 2: NIELSEN PARTICIPATION GUIDELINES

#	Heuristic	Explanation
1	Make it easier to contribute	The lower the overhead, the more people will jump through the hoop. For example, Netflix lets users rate movies by clicking a star rating, which is much easier than writing a natural-language review.
2	Make participation a side effect	Even better, let users participate with zero effort by making their contributions a side effect of something else they're doing. For example, Amazon's *"people who bought this book, bought these other books"* recommendations are a side effect of people buying books. You don't have to do anything special to have your book preferences entered into the system. Will Hill coined the term **read wear** for this type of effect: the simple activity of reading (or using) something will "wear" it down and thus leave its marks — just like a cookbook will automatically fall open to the recipe you prepare the most.
3	Edit, don't create	Let users build their contributions by modifying existing templates rather than creating complete entities from scratch. Editing a template is more enticing and has a gentler learning curve than facing the horror of a blank page. In avatar-based systems like Second Life, for example, most users modify standard-issue avatars rather than create their own.
4	Reward - but don't over-reward - participants	Rewarding people for contributing will help motivate users who have lives outside the Internet, and thus will broaden your participant base. Although money is always good, you can also give contributors preferential treatment (such as discounts or advance notice of new stuff), or even just put gold stars on their profiles. But don't give too much to the most active participants, or you'll simply encourage them to dominate the system even more.
5	Promote quality contributors	If you display all contributions equally, then people who post only when they have something important to say will be drowned out by the torrent of material from the hyperactive 1%. Instead, give extra prominence to good contributions and to contributions from people who've proven their value, as indicated by their reputation ranking.

APPENDIX 3: PREECE SOCIABILITY HEURISTICS

#	**Heuristic**
1	Clearly stated purpose
2	Clear policies and rules
3	Dynamics of interactions like f2f interactions - Natural and active discussions
4	Supporting both deep and light discussions (or content-creation) • Reading without posting allowed • Member control on discussion, not moderators • Supporting weak ties between members • Supporting the sense of connectivity to other users
5	Supporting member commitment • Information updated regularly - New topics introduced regularly • Community attracts new users • Community reaches out to lurkers
6	Support privacy • Password needed • Guarantee privacy of the personal information • Secure environment for private discussion
7	Self-expression • Allowing user profile creation • User photos or avatars not necessary
8	Reliable and up-to-date content/information
9	Supporting the evolution of purpose and community • Accurate and up-to-date information about the community/service/changes

APPENDIX 4: BACKGROUND QUESTIONNAIRE

Tutkimuksen alkukysely

Osallistujan taustatiedot:

Sukupuoli: ☐ nainen ☐ mies

Ikä: _____

Ammatti tai opiskeluala: _____

Millaista liikuntaa harrastat?

_____

Miksi harrastat liikuntaa?

_____

Mitkä ovat tavoitteesi liikunnassa?

_____

Kuinka usein harrastat liikuntaa?
_____ kertaa viikossa

Harrastatko liikuntaa useimmiten
- ☐ yksin
- ☐ yhdessä toisten kanssa
  kenen kanssa? _____

Kirjaatko treenitietoja ylös? Jos kirjaat, niin miten?

_____

Mistä haet liikunta-aiheista tietoa?

_____

Millaista tietoa haluaisit saada muista liikunnanharrastajista tai heidän treeneistään Internet-palvelun avulla?

_____

Jaatko liikuntaharrastustasi koskevia tietoja ja tuloksia muiden kanssa? Mitä ja kenen kanssa?

_____

Käytätkö liikunta-aiheisia Internet-palveluita? Mitä?

_____

Käytätkö sosiaalisia verkkopalveluja? Mitä? Rastita sopiva vaihtoehto.

- ☐ Facebook
- ☐ MySpace
- ☐ YouTube
- ☐ Twitter
- ☐ Keskustelufoorumit
- ☐ Jotain muita, mitä?_____

Vaihdatko näissä palveluissa ajatuksia tai tietoja liikunnasta? Kuvaa millaista.

_____

Käytätkö sykemittaria harrastaessasi liikuntaa?

- ☐ Aina/lähes aina
- ☐ Joskus
- ☐ En käytä sykemittaria ollenkaan

Suunto Movescount: Mitä toivoisit liikunta-aiheiselta verkkopalvelulta?

_____

Suunto Movescount: Millaisia odotuksia sinulla on palvelun koekäyttöä koskien?

_____

Jäikö jotain, mitä haluaisit vielä sanoa?

_____

_____

Kiitos vastauksistasi!

APPENDIX 5: USER EXPERIENCE QUESTIONNAIRE

Suunto Movescount: Millaisia odotuksia sinulla oli palvelusta?
1.asia

_____

2.asia

_____

3.asia

_____

Ympyröi kuinka vahvasti olet samaa tai eri mieltä seuraavista väittämistä

Suunto Movescount: Vastasiko palvelu odotuksiasi?

ei, alitti selvästi 1 2 3 4 5 6 7 kyllä, ylitti selvästi
Miksi?

_____

Pystyitkö ilmaisemaan itseäsi palvelussa haluamallasi tavalla?

en pystynyt 1 2 3 4 5 6 7 kyllä, se onnistui hyvin
Miksi?

_____

Saitko palvelussa riittävästi tietoa muista käyttäjistä?

en saanut 1 2 3 4 5 6 7 kyllä sain
Miksi?

_____

Pääsitkö mukaan palvelun toimintaan ja keskusteluihin?

en päässyt 1 2 3 4 5 6 7 kyllä pääsin
Miksi?

_____

Pystyitkö tekemään palvelussa, mitä halusitkin?

en pystynyt 1 2 3 4 5 6 7 kyllä pystyin
Miksi?

Kannustiko palvelu tuottamaan olemaan aktiivinen ja tuottamaan sisältöä?

ei kannustanut 1 2 3 4 5 6 7 kyllä
Miksi?

Oliko palvelussa riittävästi uutta ja kiinnostavaa sisältöä?

ei 1 2 3 4 5 6 7 kyllä
Miksi?

Kuinka todennäköisesti suosittelisit tätä palvelua ystävällesi?

erittäin epätodennäköisesti 1 2 3 4 5 6 7 erittäin todennäköisesti
Mitä kertoisit tai minkälaisen suosituksen antaisit ystävällesi?

Suunto Movescount: Kuinka todennäköisesti käyttäisit tätä palvelua valmiina arkielämässäsi?

erittäin epätodennäköisesti 1 2 3 4 5 6 7 erittäin todennäköisesti
Miksi?

Jäikö jotain, mitä haluaisit vielä sanoa palvelusta tai tutkimuksesta?

KIITOS VASTAUKSISTASI!

APPENDIX 6: INTERVIEW QUESTIONS

Aluksi

Suunto Movescount: Miltä käyttöjakso on tuntunut?

Suunto Movescount: Onko ollut jotain palvelun käyttöön liittyviä ongelmia?

Nokia / Polar: Mihin olet käyttänyt palvelua / Mitä olet tehnyt palvelulla?

Nokia / Polar: Kuinka kauan olet käyttänyt palvelua?

Nokia / Polar: Kuinka usein käytät palvelua (esim. aina lenkin jälkeen vai myös muulloin)?

Käyttökokemus

Voisitko omin sanoin kertoa käsityksesi tästä palvelusta? Mitä sillä voidaan tehdä?

Kenelle se on tarkoitettu?

Suunto Movescount: Millaista oli käyttää palvelua?

Suunto Movescount: Oliko helppoa/vaikeaa? Miksi?

Mitä olet tähän mennessä tehnyt palvelulla?

Mitä kokeilit ja mitä et?

Mistä ominaisuuksista pidit?

Onko palvelussa jotain mistä et pidä? Miksi?

Oliko palvelu kuten odotitkin? Miksi/miksi ei?

Onko palvelussa jotain mitä et pidä tarpeellisena? Miksi?

Oliko jotain mitä olisit halunnut tehdä palvelussa, muttet voinut? (Palvelussa ei ollut sitä ominaisuutta tai ko. ominaisuus ei toiminut?)

Mitä pidit palvelun visuaalisesta ulkoasusta? Oliko palvelun visuaalisessa asussa jotain josta et pitänyt tai jotain joku ärsytti, esim. värit tai ikonit?

Oliko käytössä jotain muutoksia koejakson aikana?

Oliko alussa jotain ongelmia, jotka selvisivät myöhemmin?

Muuttuivatko käyttötilanteet ja -tavat jotenkin?

Muuttuiko käsityksesi palvelun kiinnostavuudesta tai tarpeellisuudesta jakson aikana?

Nokia / Polar: Käytätkö muita verkkopalveluita tai tietokoneohjelmia (tai esim. kynä ja paperi) kuntoilusi seuraamiseen? Mitä?

Nokia / Polar: Mihin käytät eri palveluita ja ohjelmia?

Nokia / Polar: Miksi olet valinnut juuri tämän verkkopalvelun?

Nokia / Polar: Onko toisissa käyttämissäsi palveluissa ominaisuuksia, joita haluaisit tähän palveluun? Mitä?

Sisältö

Millaista sisältöä olet lisännyt palveluun?

Millaista tietoa olisit halunnut lisätä palveluun, mutta et pysynyt?

Oletko tutustunut toisten lisäämään sisältöön? Mitä mieltä olet siitä?

Olivatko muiden lisäämät harjoitukset kiinnostavia?

Mitä dataa haluaisit siirtää palveluun? Miten? (mobiili, sykemittarin data jne.)
Mikä sinua kannustaa lisäämään sisältöä?
Nokia / Polar: Lisäätkö lenkkisi aina verkkopalveluun?
Nokia / Polar: Miksi jätät osan lenkeistä lisäämättä?
Nokia / Polar: Mitä tietoja liität lenkkeihisi perustietojen (aika, matka, nopeus) lisäksi?

Sosiaalisuus
Nokia / Polar: Lenkkeiletkö yleensä yksin vai harjoituskumppanien kanssa?
Nokia / Polar: Miten sovitte lenkkien ajasta ja paikasta?
Oletko ollut tekemisissä toisten käyttäjien kanssa palvelussa?
Oliko palvelussa mielestäsi riittävästi sosiaalisuutta?
Millainen vuorovaikutus sinua kiinnostaa? Mitä haluaisit lisää?
Saitko jotain palautetta muilta käyttäjiltä? Kerro tarkemmin minkälaista.
Minkälaista palautetta/kommentteja haluaisit muilta käyttäjiltä omasta sisällöstäsi (treenit, treeniohjelmat) urheiluyhteisöpalvelussa?
Saitko riittävästi tietoa muista käyttäjistä? Mitä haluaisit tietää muista käyttäjistä?
Suunto Movescount: Haluaisitko kutsua palveluun muita ihmisiä? Keitä?
Suunto Movescount: Miten vertaisit muita käyttämiäsi urheilupalveluita Movescountiin?
Nokia / Polar: Oletko suositellut palvelua tutuillesi? Miksi/Miksi et?

Yksityisyys
Mitä haluat kertoa itsestäsi muille käyttäjille? Mitä et?
Suunto Movescount: Miten haluaisit rajoittaa tietojesi näkyvyyttä palvelussa? (Public, public for my groups, private) Minkä valitsisit?
Suunto Movescount: Millaista tietoa haluaisit laittaa itsestäsi esille profiilisivullesi tämäntyylisessä palvelussa? Mitä et halua kertoa?
Nokia / Polar: Oletko määrittänyt profiilisi julkiseksi palvelussa? Miksi/Miksi et?
Nokia / Polar: Mitä tietoja olet syöttänyt profiiliisi? (vain pakolliset?)
Nokia / Polar: Kuinka usein päivität profiilisi tietoja?

Yhteenveto käyttökokemuksesta
Mitkä ovat mielestäsi palvelun parhaimmat ominaisuudet? Entä huonoimmat?
Suunto Movescount: Käyttäisitkö tätä palvelua arkielämässäsi? Miksi/miksi et?
Tuleeko mieleesi vielä jotain palvelusta / haluaisitko antaa jotain palautetta tutkimuksesta?

APPENDIX 7: DIARY STUDY: FORM 1

Movescount - käyttökerta 1

Käyttökerran päivämäärä: _____

Kuinka kauan käytit palvelua? _____

Mitä asioita teit palvelulla?

_____
_____

Millaisen ensivaikutelman sait palvelusta?

_____
_____

Mikä palvelun tarkoitus vaikuttaisi olevan?

_____
_____

Kuinka houkuttelevalta palvelu vaikutti? Miksi?

_____
_____

Oliko palvelun etusivulla mielestäsi jotain epäselvää? Mitä?

_____
_____

Mitkä asiat palvelussa tuntuivat toimivilta ja miellyttäviltä?

_____
_____

Mitkä asiat palvelun käytössä harmittivat sinua tai eivät toimineet kunnolla?

_____
_____

Mihin muihin asioihin kiinnitit huomiota?

_____
_____

APPENDIX 8: DIARY STUDY: FORM 2

Movescount - käyttökerta 2-n

Käyttökerran päivämäärä: _____

Kuinka kauan käytit palvelua? _____

Mitä asioita teit palvelulla?

_____
_____

Miltä käyttötilanne tuntui? Miksi?

_____
_____

Mitkä asiat palvelussa tuntuivat toimivilta ja miellyttäviltä?

_____
_____

Mitkä asiat palvelun käytössä harmittivat sinua tai eivät toimineet kunnolla?

Kuinka paljon?
(1=vähän, 2=jonkin verran, 3=paljon)

	(1-3)
	(1-3)
	(1-3)

Muuttuiko käsityksesi palvelusta? Miten?

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Mihin muihin asioihin kiinnitit huomiota?

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APPENDIX 9: HEURISTIC EVALUATION: SUUNTO MOVESCOUNT

Problems related to sociability: PROFCOM

Location	Problem	Suggestions	Severity
1. Us	There's no prepared content users could react to.	Add a forum and a possibility for users to publish own content. Add a news service that features fitness-related news. Give users the possibility to discuss news items.	development idea
1.2 Others	Deepening communication is not possible. Sending private messages to other users is not possible.	Add a forum that features the possibility to send private messages.	development idea
1.2 Others	It is difficult to find people with similar interests using the site due to insufficient profiles and discussion.	Add a forum. Add profile fields that enable users to express themselves informally.	development idea
1.2 Others	Active users do not have the opportunity to bring forth their expertise or content (apart from comments related to moves).	Add a forum and a possibility for users to publish their own content (articles etc.).	development idea
1.2 Others	The site does not support different user roles.	For example, active users could be given the opportunity to take part in administrative duties (instructing new-comers, developing applications etc.).	development idea

1.2.3 Other users	Active users do not receive acknowledgement or rewards from taking part in the community (just adding moves for now).	Create a system to reward active users.	development idea
1.2.3 Other users	Active users do not receive acknowledgement or rewards from other users.	Enable users to comment and rate other users' moves and possible additional content.	development idea
2. Me	The site does not include a discussion forum.	Add a forum for informal discussion.	development idea
2. Me	For new-comers, there's no discussion or possibility to ask other users for advice.	Add a forum for informal discussion.	development idea
2. Me	Users can't share their affairs or matters of interest on the site.	Add a forum and a possibility for users to publish their own content.	development idea

Problems related to sociability: Nielsen Participation Guidelines

Location	Problem	Suggestions	Severity
1. Us	Low level participation is not supported, participation requires adding moves.	Add for example votes (related to the theme) that users can take part in.	development idea

Problems related to sociability: Preece Sociability Heuristics

Location	Problem	Suggestions	Severity
1.1.1 Home	Excluding users' moves, the site's content is not continuously updated.	Add for example a news service that features constantly updated content.	3
2. Others	Group creation is limited based on sports.	Groups shouldn't be limited based on sports since groups can form based for example on location regardless of sport.	3

4. Help	For now (until the help section is finished): The site's conventions and rules haven't been clearly specified.	Include the site's conventions and rules in the help. Present conventions alongside the related features.	3
2. Others	User searches and organizing and filtering users are insufficient.	In a communal sense, finding other users is essential and there should be a focus on search functions.	2
4. Help	The site doesn't include information about how it's going to be developed.	Add a list of upcoming changes and new features. Update the list continuously so that users see that development continues. Give users the chance to speak out about developing the site.	2

Features supporting sociability

Location	Feature	Suggestions
1. Us	The user sees his/her location constantly from the menu (the active link is highlighted).	
1. Us	The site's menus are consistent and navigation can be performed using the top menu.	
1. Us	Lurking is possible, lurkers have access to public content.	
1.1.Movescount (front page)	Aggregate data about the community on the front page works well. It features information about the number of users and their moves. It also includes the number of currently active users.	
1.1.Movescount (front page)	Recent events on the site are brought forth.	
1.1.Movescount (front page)	The site's purpose is stated clearly on the front page.	
1.2.2 Groups	It's possible to form a group around a matter of interest (sport).	There shouldn't be a requirement for a specific sport for a group.

1.2.3 Other users	A user's profile includes the groups he/she belongs to which increases the feel of community.	
1.2.3.Other users	The icons are clear, simple and pleasant.	
1.2.3.Other users	It's possible to browse all users.	The search function could be improved, using keywords.
1.2.3.Other users	It's possible to browse users based on sport.	Different ways to browse users, e.g. based on locality.
1.3.Getstuff	Sharing training programs with others supports communality.	
2. Me	The site uses password protection.	The site should also feature advice on creating a good password. There can for example be constraints related to the password's length and form.
2.1.1 Me	Participation in the community can be a side-product of training (if the primary use is logging training data).	
2.1.2 Me & Others	It's easy to track other users' (friends') moves. The user also sees who track his/her own moves.	
2.1.Register	Registration is implemented logically and checking the availability of a username works.	
2.2.1.Move app	The animations in the sliders worked well.	
2.4 Settings	It's possible to create a personal profile on the site.	
2.4 Settings	A photo can be included in the profile.	
2.4 Settings	Users can limit the visibility of their profile data (public, public for own groups, private).	Privacy settings should be brought forth when creating the profile!
3.3.Test login	Login testing gives an idea of how the site will work.	

APPENDIX 10: HEURISTIC EVALUATION: NOKIA SPORTS TRACKER

Problems related to sociability

Location	Problem	Suggestions	Severity
5. Community	The site doesn't include a section for informal discussion.	Add a discussion forum.	3
5. Community	User profiles don't give much information about what the person is like.		3
5. Community	It's not possible to send (private) messages to other users.	Enable users to send private messages. Enable public discussion, e.g. add a personal notice board. Add a discussion forum.	3
6. My Profile	Users can create a profile but it contains relatively little information.	Add more information to user profiles.	2
6. My Profile	The profile contains just one informal input field.	Add more informal input fields. This helps the user to create a personal identity.	2
6. My Profile	There is no option for the users to share their matters of interest.	Add more informal input fields. Add a possibility for users to write and share articles.	2
5. Community	There's no section for newcomers to ask for advice.	Add a discussion forum and a section for newcomers.	2
5. Community	There's no prepared content that users could react to (other than workouts).		2
4. Groups	The group comments are public.	Enable users to communicate just within the group.	2
3. Training buddies	Finding a new training buddy is quite difficult with the current search function.	Add more diverse methods of finding other users.	2

5. Community	Users are unable to participate in the development of the site.		2
5. Community	Active users are unable to introduce their views or advice (to help other users).		2
6. My Profile	The users' avatars are quite small.	The avatars should be bigger or include links to bigger versions.	1
5. Community	'Community in a nutshell' doesn't include the number of registered or active users.		1
5. Community	There are no incentives for participating (adding workouts) except the workout statistics.		1
1. Front page	Apart from the map, the front page doesn't contain aggregates e.g., most popular workouts, or most active users.	Add more information about other users and their workouts.	1
2. Dashboard	Users can't personalize the displayed information.	Enable the user to customize at least his/her 'Dashboard' using aggregates etc.	1

Features supporting sociability

Location	Feature
6. My Profile	It's possible to create a profile.
6. My Profile	It's possible to include an avatar in one's profile.
6. My Profile	The user can decide which parts of his/her profile are public.
5. Community	'Community in a nutshell' includes some information about the activities of other users.
5. Community	Users see other users' recent shared workouts.
5. Community	The workouts contain information about how many times they've been viewed.
2. Dashboard	Participating (e.g., submitting workouts) doesn't require expertise.
4. Groups	It's possible to form a group around a subject of interest.

4. Groups	Group members can communicate with the whole group through comments.
4. Groups	Finding users interested in the same activities is quite easy with the help of groups.
5. Community	It's possible to use the site without participating (adding workouts) or registering.
5. Community	Users can give other users' workouts votes (+/-) and comment on them.
1. Front page	The front page contains a map of recent new workouts.
5. Community	Content (workouts and profiles) created by users is clearly displayed on the site.
6. My Profile	Sharing workouts is easy thanks to direct URLs.
2. Dashboard	Participation is a side product of adding (public) workouts.

APPENDIX 11: HEURISTIC EVALUATION: POLAR PERSONAL TRAINER

Problems related to sociability

Location	Problem	Suggestions	Severity
1. Home	Apart from the news, the user's homepage doesn't include any aggregates about the site's new content (challenges etc.).		3
1. Home	Content (training sessions, profiles etc.) created by users isn't clearly displayed on the site. The homepage doesn't create a communal feel.		3
3.5 User Search	The site doesn't provide any information about the number of users or who they are.		3
3.5 User Search	User profiles don't give much (if any) information about what the person is like.		3
3. Community	It's not possible to create groups apart from the temporary challenges.		3
3.5 User Search	Finding like-minded users is very difficult with the current search function.	Add more diverse methods of finding other users.	3
5.1 My Profile	Users can create a profile but it contains relatively little information.	Add more information to user profiles.	2
5.5 My Public Profile	The public profile contains just one informal input field.	Add more informal input fields. This helps the user to create a personal identity.	2

5.5 My Public Profile	Apart from the separate forum there is no option for the users to share their matters of interest.	Add more informal input fields. Add a possibility for users to write and share articles outside the forum.	2
3.5 User Search	Apart from the separate forum the site doesn't provide any information about who are active.		2
3.4 Polar Forum	The site and forum don't include a section for questions from newcomers. Such questions are scattered around the forum.	Create a section for newcomers with frequently asked questions and a possibility for users to advice each other.	2
6. Articles	The site's articles are separate from the rest of the site and forum. Discussing these articles is therefore cumbersome.		2
6. Articles	Articles written by users can't be added to the current collection (written by administrators). The only way for users to publish articles is through the forum.		2
3. Community	Users are unable to participate in the development of the site.		2
3. Community	Users can't directly rate or comment on other users' training sessions.		2
3.4 Polar Forum	The forum's status descriptions (Junior/Senior Member) are based merely on quantity of posts.		1
3.4 Polar Forum	Users can't rate other users' forum posts (other than submitting a new post).		1

5.3 General Settings	Users can't personalize the displayed information.	Enable users to customize at least their homepages using aggregates etc.	1

Features supporting sociability

Location	Problem
5.1 My Profile	It's possible to create a profile.
5.5 My Public Profile	It's possible to include an avatar in one's profile.
3.4 Polar Forum	The site includes a forum for informal discussion.
3.3 My Contacts	Users can send each other (contacts) private messages.
5.5 My Public Profile	The user can decide which parts of his/her profile and training are public.
3.4 Polar Forum	The forum includes typical statistics for messages (replies, views).
3.4 Polar Forum	The forum features information about who are currently active.
3.4 Polar Forum	The forum is a good place for newcomers to ask questions.
3.4 Polar Forum	The forum includes a discussion for features users would like to have on the site.
2.1 Diary 3.4 Polar Forum	Participating (e.g., adding training sessions, informal discussion) doesn't require expertise.
6. Articles	The site includes articles about physical training which can help users and generate discussion.
3.1 Challenges	The comments related to challenges are only visible to the participants.
3.4 Polar Forum	Active users are able to introduce their views or advice (to help other users) through the forum.
3.1 Challenges	The challenges are good incentives for adding training sessions.
3.1 Challenges	Status descriptions (Junior/Senior Member) based on number of posts encourages discussion.
1. Home	After login the user immediately sees the latest news and the status of his/her challenges and training programs.